

Contractors and Engineers

MARCH 1956

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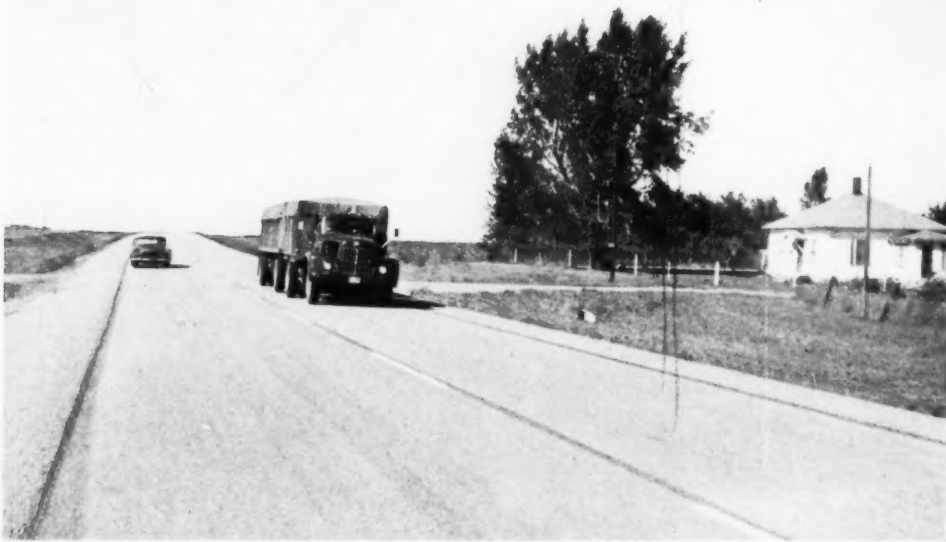
MAR 13 1956

SCIENCES

magazine of modern construction



Spreading a highway's cost over a 10 year period



Paving 20 miles of South Dakota's Route 25 with an intermediate type of Texaco Asphalt construction, described in column at the right.

South Dakota completed the first stage of the 20-mile highway project in 1955, using an intermediate type of Texaco Asphalt pavement. Approximately 10 years from now, a hot-mix asphalt surface will be added, strengthening the original pavement and giving it a new lease on life.

By this stage construction method of building roads with Texaco asphalt products, traffic is adequately served at all times, while cost is distributed over the years.

The first stage of the South Dakota project consists of a 9-inch gravel base, primed with Texaco Slow-curing Asphaltic Oil. A plant-mixed Texaco asphalt surface of the cold-laid type was constructed on the base to a compacted thickness of two inches, followed by a seal coat of Texaco Rapid-curing Cutback Asphalt and sand cover.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils provide the road builder with a variety of heavy-duty, intermediate and low-cost types of construction for highways, streets, toll roads, airports, etc. Helpful information regarding all of these types is supplied in two booklets which can be secured without obligation by writing our nearest office.

CONTRACTOR

G. H. Lindekugel and Sons Construction Company, Mitchell, S. D.

THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York 17
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TEXACO ASPHALT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 201

Contractors and Engineers

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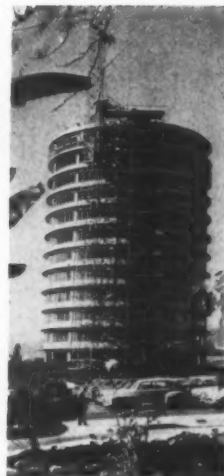
Equipment clears way for Brownlee Dam job Pg. 114



Special assemblies for concrete joints Pg. 124



Work on Mackinac Bridge Pg. 73



New circular office building Pg. 34

Men and machines

Modern construction machinery, engineered for high production and designed to work for maximum profit, makes fast construction and high production records look easy to achieve. But sometimes we get so enthusiastic about the ability of this equipment to produce that we forget one of the essentials to profitable contracting—the intelligence of the contractor himself.

His is the job of selecting the right equipment to do a specific job at a low unit cost so that profit margin remains at a maximum at all times. His knowledge of operating costs, of accurate production figures, and of up-keep expenses is essential to successful bidding. He has to get maximum production from his equipment and keep downtime to a minimum. He is responsible for relations with labor unions, tax writeoff, and job progress.

Management's handling of working relations between various crafts, another important job, requires not only a working knowledge of psychology and the skill of a diplomat, but also

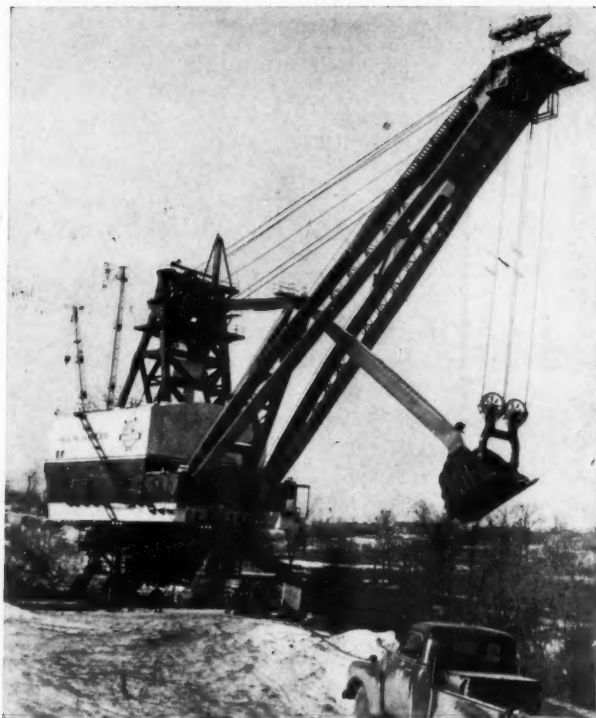
the ability to anticipate demands and to know when to make concessions and when to stand firm.

The difference between a profitable job or one that results in financial loss often depends on one man's decision that the work can best be done with a new method or new piece of machinery. Profit and loss have to be weighed in selecting just the right method to employ on a job, and just the right equipment that will get the job done at the lowest unit cost. Then the contractor has to be able to overcome prejudices for or against any method or piece of equipment, since job conditions may prove a favored machine unsuitable for a current project.

Sometimes we forget how much the success of any work depends on how a job is planned and executed. In this magazine, as in other journals, the role of equipment may perhaps be em-

phasized more than the work of men because some innovation, some change in equipment, some new machine, or some new work method has resulted in a faster, better, more efficient, or less costly job. But though it goes unsaid, we are always aware that each innovation, each change, each stride forward is made possible because men in the field, at their drawing boards, and in a dozen other places are using initiative and intelligence.

If the work of equipment makes a job more profitable, it is only because of the men responsible for its design, its use, its supervision, and its maintenance. It still takes experience, construction know-how, and an instinctive feeling for a job, particularly on the part of superintendents and key foremen, if 1956 models of equipment are to deliver all the promise designed into each unit.



ing on the disk-like floors of the 13-story circular section which, despite its modernity, had to be constructed with old-time as well as new building techniques.

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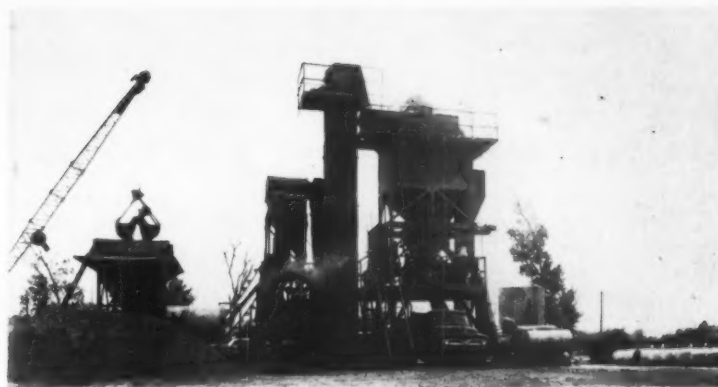
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CONTRACTORS AND ENGINEERS

A truck picks up a load of bituminous concrete at the Hetherington & Berner plant, which uses an LP-gas heating system installed by American Propane Gas, Inc., Omaha. Twelve Delta 1,000 gallon storage tanks supply fuel for the plant.



LP gas heats hot mix for road resurfacing job

**Tanks of 1,000-gallon capacity feed LP gas to burner;
about 20,000 tons of material is turned out for the project**

In what is believed to be the first application of its kind, liquified petroleum gas was used in processing about 20,000 tons of hot-mix for a resurfacing project. The experiment was so successful that the same technique will probably be used in the future in areas not serviced by natural gas.

During a four-week resurfacing project on Route 6, between Ashland and Gretna, Nebr., the contractor, Dobson Construction Co., Lincoln, Nebr., used a specially fired furnace that operated at a substantial saving.

Fuel for the Dobson field furnace was supplied from a battery of 12 LP-gas storage tanks fabricated by the Delta Tank Mfg. Co., Inc., Baton Rouge, La., producer of tanks and cylinders for LP gas and anhydrous ammonia as well as other pressure vessels for the petroleum, chemical, and petrochemical industries. Each tank is 16 feet long with a 41-inch diameter and 1,000-gallon capacity. LP gas, fed at tank pressure through a manifold connecting the series of tanks, was reduced to 50-pound pressures as it entered the burners.

The LP-gas heating system was devised and placed in operation by American Propane Gas, Inc., Omaha, distributor of LP gas and Delta storage equipment. Set up on the Platte River near Gretna, Nebr., the Hetherington & Berner asphalt-plant averaged about 1,500 gallons per day during the operations. Between 650 and 700 tons of bituminous concrete were turned out daily, and the resurfacing job was completed before the target date.

American Propane officials reported that each load of hot-mix was checked by highway department engineers as it left the Dobson furnace. During the entire 28-day job, only three loads were rejected because of improper temperatures, and all three rejections occurred on the first day, before equipment adjustments were complete.

THE END

In a disaster, the Red Cross grants assistance on the basis of needs beyond those that can be met from a family's initiative and resources.

MARCH IS RED CROSS MONTH!

MARCH, 1956

4 YEARS' WORK IN 3 HELPS "MIGHTY MITE"

STEM MOODY MISSOURI

GOOD YEAR WAS THERE!

THE GAVINS POINT DAM is a "mite" compared with its giant fellow dams of the vast Missouri Basin Development Program. But Gavins' 8,700-foot crest length and 800-foot base-width make it a MIGHTY mite. After a flooded-out start, 2 million yards were moved in a record comeback and classic 8-day closure, spearheaded by end-dumps as shown above. The tires are Hard Rock Lugs by Goodyear.

LATEST IN TIRE-MAINTENANCE TRUCKS helps keep big fleet of earth-movers rolling.

Mighty fine cost-cutters on tough construction jobs— 3-T NYLON CORD Goodyear Job-Proved Tires

In 2 years' rugged service on the toughest, fastest-stepping jobs, Goodyear's exclusive 3-T NYLON CORD has proved itself the greatest tire SAVER in 21 years! It keeps bruise-breaks and heat blowouts close to the vanishing point, virtually eliminates ply separation and flex failure—keeps tires in shape for many more re-lugs and recaps. If you want the most durable cord, plus the best in tire design, plus the toughest rubber compounds, specify Goodyear 3-T NYLON CORD Tires for every wheel on every job! Goodyear, Truck Tire Dept., Akron 16, Ohio

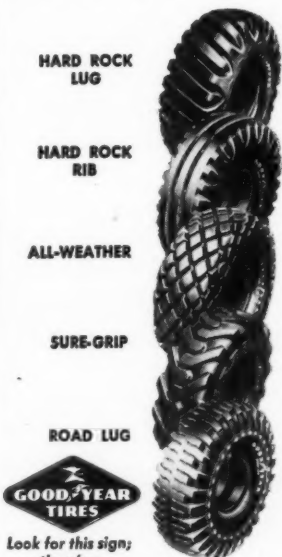
FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE BUILT WITH 3-T NYLON CORD

Buy and Specify

GOOD YEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

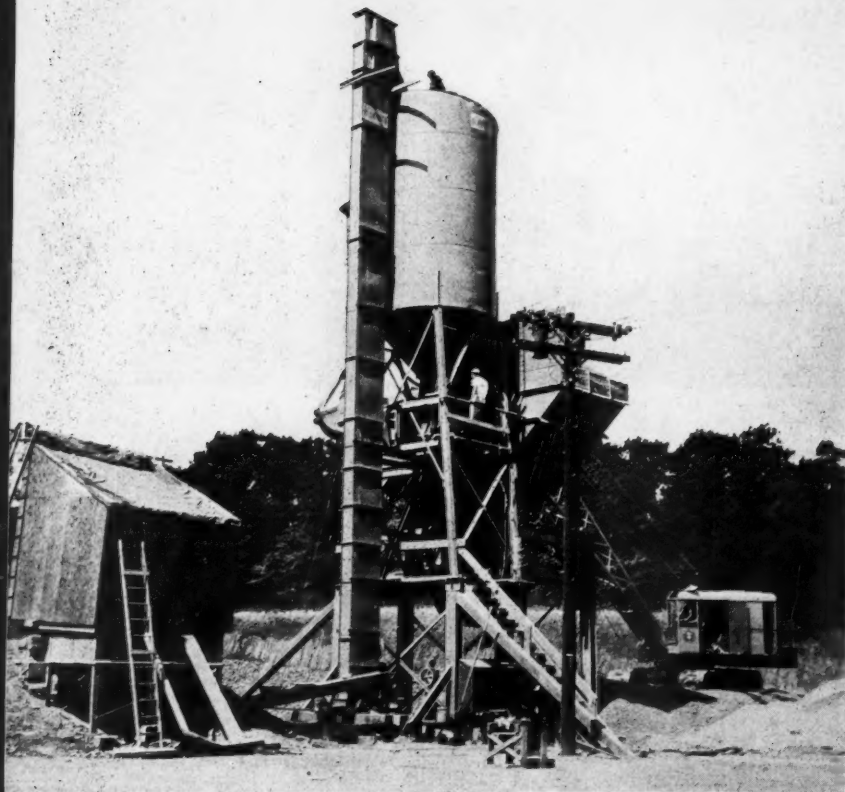
Road Lug, All-Weather, Sure-Grip—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio



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there's a
Goodyear dealer near you

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

For more facts, use Reader-Reply Card opposite page 18 and circle No. 202



Batch setup hikes output of concrete for expressway

by ANTHONY N. MAVROUDIS,
field editor

Charging batch trucks with aggregate and cement in one operation, this Blaw-Knox plant reaches an average production of 550 batches per 10-hour day on the expressway project. The 400-barrel silo is set higher than the aggregate bin and a chute carries cement to trucks just loaded with aggregate. A 70-foot elevator feeds the silo; a Lorain crane with 60-foot boom and 2-yard clam keeps the bin filled.

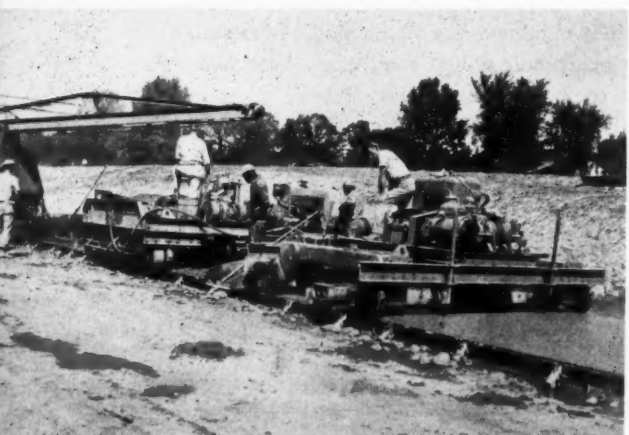
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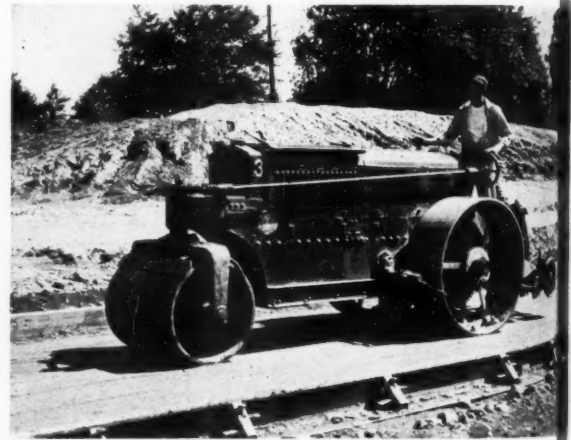
1. At the paving site, a Buckeye Model FG 13 Finegrader works just ahead of the paver to bring the subgrade to final elevation.



3. With aggregates dumped, a cement bucket on the truck opens automatically and a batch goes to the Koehring paver. A Mack 5,000-gallon tanker supplies water.



5. A Blaw-Knox double-screed transverse finisher smooths the surface of the new concrete. Consolidation is done by a workman with an electrically driven vibrator.



2. Just behind the Finegrader, a Buffalo-Springfield 10-ton three-wheel roller handles final compaction.



4. A strikeoff, pulled by the paver, allows wire reinforcing to be placed before the Blaw-Knox spreader brings concrete to the required 8-inch thickness.



6. The last rig in the lineup is this Koehring longitudinal floating machine. Hand finishing and a burlap drag complete the operations.

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Trucks are charged almost simultaneously with cement, aggregate; materials are kept separated until they are discharged to paver

Production of about 3,000 feet of 12-foot lanes of concrete roadway on a five-mile expressway between Hartford and Windsor, Conn., has been due largely to a unique concrete batch plant setup and contractor-rigged batch trucks that allowed high production to be sustained during the course of the job. With the system, Savin Construction Corp., East Hartford, Conn., turned out an average of 550 batches per 10-hour day for the project.

This \$2,755,000 job, requiring about a million cubic yards of material to bring the expressway to grade, consists of two 24-foot roadways separated by a 6 to 17-foot raised, grassed median. Bituminous concrete outside shoulders, 10 feet in width, and five structures and two box culverts complete the work.

Plant charged fast

Only one operation was used to charge aggregates and cement into trucks at the batch plant, which was located near the southern tip of the project. This was possible, since the Blaw-Knox 400-barrel cement silo was erected next to, and higher than, the Blaw-Knox 30-cubic yard aggregate bin. The elevated position of the silo permitted an incline chute to be used to carry cement to batch trucks located underneath the aggregate bin. After the few seconds needed to charge batch trucks with aggregates, cement was released to fill the cement buckets on the trucks.

The cement buckets were rigged with free-swinging release flaps that were held closed by the aggregates already in the trucks. When the 3-batch-capacity trucks delivered batches to the paver, the aggregates were emptied first and the cement bucket flaps swung open automatically so that cement went into the paver.

In this way the contractor kept within prescribed specifications, which do not allow premixing before a concrete reaches the paver. The system also allowed batch trucks to load fast and keep a steady supply moving to the paver.

The 40-barrel-capacity trucks delivering cement to the plant rode up an earth ramp to unload into a hopper feeding a screw conveyor. The conveyor, in turn, fed the 70-foot-high enclosed Blaw-Knox elevator. Aggregates were also delivered by trucks, which unloaded the 2-inch stone, ¾-inch stone, and sand into three separate stockpiles.

The three-compartment Blaw-Knox bin was kept full with the two different stones and the sand by a Lorain crane with 60-foot-boom and 2-cubic-yard clamshell. Measured dry, each 37-cubic-foot batch contained:

Sand	1,630 pounds
2-inch stone	1,484 pounds
¾-inch stone	1,484 pounds
Cement	812 pounds

The correct amount of cement was

For more facts, circle No. 203→

weighed out by a double-beam scale, built to Blaw-Knox specifications, and dumped into the inclined chute by an electrically operated release. A similar type of scale, but with a manually operated release, weighed out aggregate. Electric power for the plant's operation was purchased from the local supply.

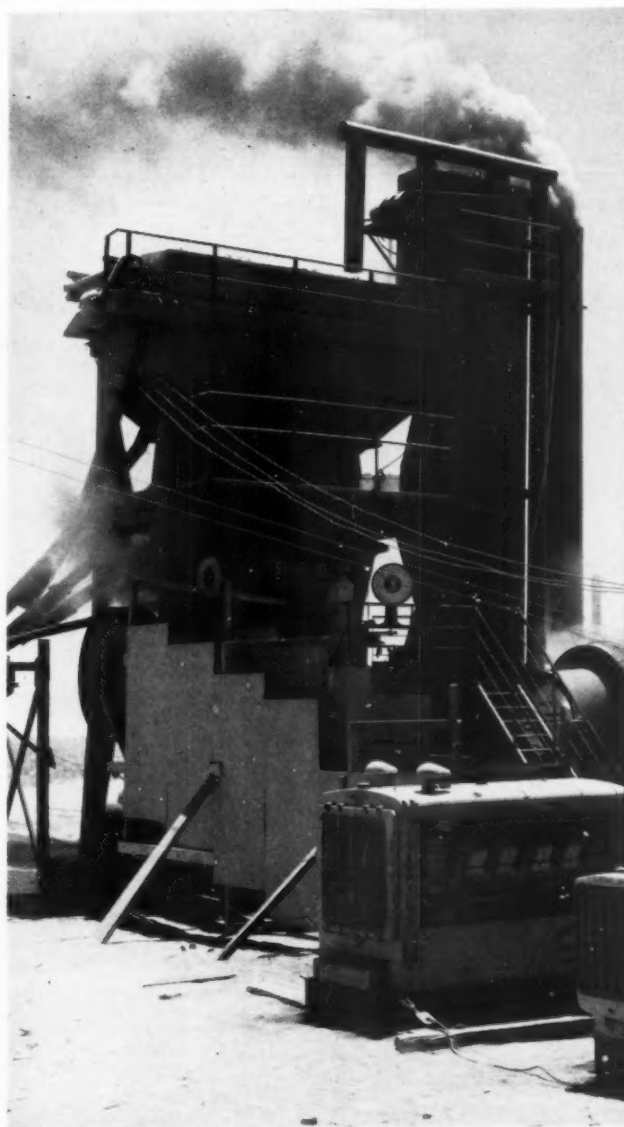
At the paving site, approximately

4,000 feet of 8-inch forms were available, and a minimum of 500 feet of these were kept ahead of the paver. An air hammer, powered by a truck-mounted air compressor, drove the form pins as the 12-foot lanes were prepared.

A Buckeye Model FG 13 Finegrader rode the forms ahead of the paver, cutting the run-of-the-bank sub-

grade to the desired elevation. Between the subgrader and the paver was a Buffalo-Springfield 10-ton three-wheel roller that handled final compaction.

The Koehring dual-drum paver, supplied with water by a Mack 5,000-gallon tanker, rode outside the forms. Eight batch trucks, each carrying three batches, kept the paver sup-



ACID TEST!

"These CAT* Engines take it in stride"

"If you want to give an engine the acid test," says Frank Muren, superintendent of this road job in the Mojave Desert, "put it in a hot plant like ours. There's heat and plenty of dust, but these Cat Engines take it in stride."

There are three Caterpillar D17000 Engines in this hot plant at Edwards Air Force Base, Calif., with more than 14,000 hours among them—and *no repairs*. One of them is shown here powering the dryer, together with a Cat D318 supplying auxiliary power. The contractors, Fredericksen and Kasler of Sacramento, Calif., have seven Caterpillar Engines on the job with a total of about 25,000 hours.

Cat Diesels owe their trouble-free work lives to such features as "Hi-Electro" hardened crankshaft journals, long-lasting aluminum alloy bearings, and highly effective filters and seals that keep lubricants in and harmful grit out.

It's *economical* work life, too. Every Cat Diesel is built to operate cleanly and efficiently even on low-cost fuels, such as No. 2 furnace oil. The rugged simplicity of these efficient power units means easy maintenance, minimum down time, low repair bills.

There's a Caterpillar Engine or Electric Set for *your* job requirements, to 520 HP and 315 KW. Your Caterpillar Dealer will gladly help you select the equipment that will do more work for you at lower cost. See him soon—you can count on him whenever you need fast, reliable service or original Cat parts.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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**MODERN
HEAVY-DUTY POWER**

plied. A strikeoff rode the forms as it was pulled by the paver, cutting 2½ inches from the freshly placed concrete so that welded wire reinforcing might be placed ahead of the spreader. Once the wire mesh was in place, concrete was dumped in front of the Blaw-Knox spreader and finished to the required 8-inch thickness. Concrete consolidation was handled by a workman walking behind the spreader and using an electrically driven vibrator supplied with power by the spreader.

Completing the paving train were a Blaw-Knox double-screed transverse finisher and a Koehring longitudinal floating machine. Hand finishing of the concrete surface was done with hand lutes having aluminum edges and with a burlap drag.

A 14-day curing period was allowed for the slab, which was covered with Sisalkraft curing paper as soon as initial set took place. Forms were stripped in 24 hours, the form pins being pulled by a chain hook powered off a truck's motor.

Expansion joints, placed every 100 feet, were sealed with a bituminous filler after curing. These joints consisted of a ¾-inch-thick mastic compound held in place by wire ties and capped to allow continuous paving. Before concrete had attained initial set, the caps were removed and the 1½-inch-deep opening was later filled. After curing paper was removed, contraction joints were sawed at 25 feet on centers.

Personnel

L. F. McCarthy was the superintendent for Savin Construction Corp. The project engineer for the Connecticut State Highway Department was Warren Whiton, and W. Phillips was the inspector for the concrete finishing.

THE END

Adjustable trestle

■ A folding, adjustable scaffold trestle has been introduced by Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif.

Only 40 inches wide, the Hi-Lo trestle is adjustable to any height from 2 to 10 feet, depending on the length of the legs. It can be speedily erected. It takes the place of a number of trestles of various sizes and is adaptable to work on rough or uneven ground.

For further information write to the company, or use the Request Card at page 18. Circle No. 135.

Motor grader

■ "Caterpillar No. 12 Motor Grader: A Contractor's Tool" emphasizes the outstanding features of this machine. The side shift, diesel engine, alloy-steel blade, power control box, circle and circle drawbar, and oil clutch are shown. There are action shots of the grader in various phases of work. The booklet is available in Spanish, French, and Portuguese, as well as in English.

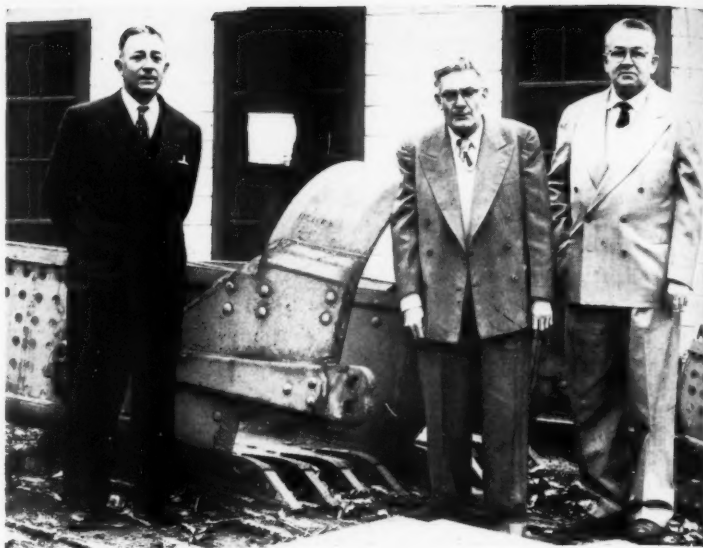
To obtain this booklet write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 20.

Flanking the retiring president of Drake-Williams-Mount, Walter H. Williams, are his successor, Arthur W. Williams, right, and the new vice president, L. D. McMahon left.

Drake-Williams-Mount makes executive changes

Walter H. Williams, president of Drake-Williams-Mount Co., Omaha, Nebr., has retired from business after 50 years of service. Instrumental in the development of the Omaha bucket, the original lightweight drag-line bucket, Mr. Williams will be succeeded by Arthur W. Williams in the top executive post.

L. D. McMahon has been named vice president.



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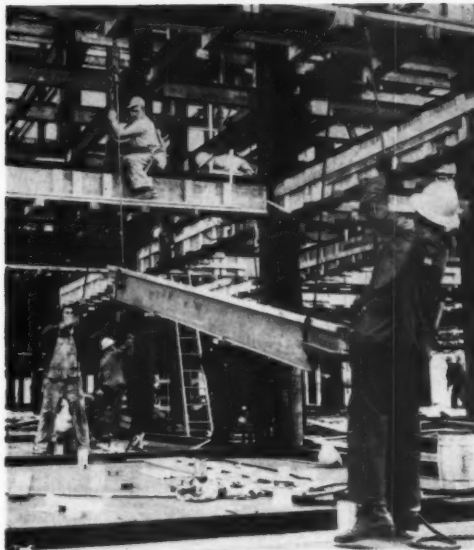
TEXACO

CONTRACTORS AND ENGINEERS

Forming method saves time, money

Lightweight beams serve as temporary joists between steel framework, their use permits other work to continue on unobstructed lower floor

The Junior Beam being hoisted into place will be used as a temporary joist to support concrete forms in the construction of the University of Pittsburgh's new Schools of the Health Professions Building. The beams will be re-used.



Get extra work from engines ... at no extra cost

It's no secret that an engine lubricated with one of the famous *Texaco Ursa Oils* delivers *more power with less fuel over longer periods* between scheduled overhauls. The reason why—

Texaco Ursa Oils, especially designed for use in diesel and heavy duty gasoline engines, embody powerful detergent and dispersive properties that keep engines clean... assure free rings, proper valve seating, full compression and complete combustion.

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You need only six Texaco Lubricants to handle all major lubrication. Cut lubricant inventory, avoid confusion and mistakes, save time and money. Full details from your Texaco Lubrication Engineer.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 204

MARCH, 1956

Junior Beams, lightweight structurals, have replaced conventional shoring methods with an unusual system being used successfully in the construction of the University of Pittsburgh's new Schools of the Health Professions Building.

Instead of the conventional shoring method, in which vertical adjustable supports hold the concrete forms in position, by bracing them from the floor below, Ragnar Benson, Inc., Pittsburgh, Pa., general contractor, is using the lightweight steel Junior Beams as temporary joists between the steel framework. After the concrete has been laid and cured, the beams are removed and used again.

The shoring technique was devised by J. G. Kassab and Walter R. Wolff of Ragnar Benson, and the Junior Beams are made by Jones & Laughlin Steel Corp., Pittsburgh.

Scheduled for completion late this year, the new \$15,000,000 building is a steel-frame structure with fireproof columns and beams and heavy reinforced-concrete slab floors. It will have a 13-story central tower with 10-story wings and a 5-story auditorium.

Work uninterrupted

Approximately 900 12-inch Junior Beams are in use on the job, but they do not impede work on the lower floors. Had the conventional method been used, about nine shores would have been needed in each bay of the building. Most of the bays are 18 feet wide, some are 20, and the remainder are of varying sizes.

Light enough to be handled by workmen, and yet strong enough to support the weight of the concrete, working loads, and motorized concrete buggies, Junior Beams suited the length of the span and the heavy concrete slabs. Work proceeded from the central section of the building, from the fifth floor up, independent of the floors below where work was delayed by architectural changes.

The concrete slab flooring varies between 7 and 8½ inches in thickness. The floors are designed for a live load of between 60 and 75 pounds per square foot, while the average dead load of the concrete slab alone is about 90 pounds per square foot.

Two different lengths of Junior Beams were used. One principal length of fixed joists served most spans, while another length, with adjustable ends, was used on the remaining odd-span bays. Because of heavy concentrated loads, the Junior Beams, spaced about 4 feet 6 inches on centers, are held in position by movable steel supports hung from the steel structure. They are firmly braced at the ½ points, at both top and bottom chords, to give lateral stability against moving loads. Camber was regulated by the wood nailer attached to the top flange.

Because of the amount of duplication involved, Junior Beams may be re-used on job after job—making for time-saving, more economical, and unimpeded construction.

THE END

Preventive winter program saves machinery from trouble due to cold and mud at Seaway

Special maintenance work keeps equipment on St. Lawrence job

Extreme weather conditions this past winter have forced contractors working on the St. Lawrence Seaway to adopt special procedures for cold-weather equipment maintenance. In addition to fighting the weather, contractors also had to combat wet marine clay that hardened like concrete



HUBER-WARCO MAINTAINER

Helps put *Profit* in variety of jobs



An All purpose— year 'round performer

The Huber-Warco M-52 Maintainer is truly a sensational performer for a wide variety of construction and highway maintenance problems. It will out-perform many machines that are larger, heavier, more costly, slower, more expensive to operate, and more limited in use.

Application of a torque converter reduces shock loads and prolongs the life of the machine. Loads are picked up and carried smoother and faster. Vehicle speed is automatically adjusted to meet load conditions. Wheel slippage is reduced, and the engine won't stall regardless of grade.

A 45½ H.P. engine gives the Huber-Warco Maintainer plenty of reserve strength for the toughest jobs. The unit weighs 6250 lbs. (7205 lbs. with calcium chloride in tires) — enough weight for all maintenance jobs.

With hydraulically controlled attachments, the Huber-Warco M-52 Maintainer will perform service as a bulldozer, lift-loader, side dozer, berm leveler, broom, patch roller, mower or snow plow.

Adding to the efficiency of the Huber-Warco Maintainer is a 9 ft. power sliding moldboard. Easy to reach controls reduce operator fatigue.

Working speeds of the Huber-Warco Maintainer range from 1.7 to 8 m.p.h. Travel speed is 21 m.p.h. for quick movement from job to job.

Get the Important Facts

For complete information, including specifications for the Huber-Warco M-52 Maintainer, and the hydraulically controlled attachments, write for your free copy of Bulletin HWM-512 today.



For a demonstration—see your nearest Huber-Warco Distributor



HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

Road Machinery

CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 205

on all the construction machinery.

Four contractors, Peter Kiewit & Morrison-Knudsen, Dutcher Construction Corp., Morrison-Knudsen, and Kiewit-Johnson & Johnson, followed the same plan of chipping mud from track rollers and other parts of the tractor between shifts. Then, during shift changes, they cleaned the mud from the boxes of haul units. Morrison-Knudsen Co., Inc., working on the Gallop Island South Channel Improvement project, used flame-throwing weed burners on particularly bad mud.

Since there is still a great deal of wet clay in the new cuts, Peter Kiewit and Morrison-Knudsen, joint-venture contractors on Long Sault Dam Cut F and Long Sault Canal, keeps a crew of laborers working on removing mud from equipment being used below the frost line.

During these shift changes, the equipment was not shut down, but was allowed to idle. Units worked two 10-hour shifts a day, with 1½ hours between. Only on weekends, after the last Saturday shift, was the equipment shut down.

Monday-morning starting

During the weekend shutdown, Kiewit-Johnson & Johnson, contractor on the Iroquois Dam, stored equipment in heated sheds. Since most of the haulage-unit beds on this job are not heated, ether spray was used around the air cleaner as a starting aid at the beginning of the first shift of the next week. A heater, placed in the radiators of equipment without gasoline engines, warmed the water before the engines were started after weekend shutdowns. The coolant in gasoline-starting engines was circulated through the starting engines and back through the diesels to pre-heat it before the start of operations.

Dutcher Construction Corp., contractor on the Grass River Locks Excavation, operates several Caterpillar DW21 tractors with C&D Movalls. In order to prevent the ejectors of these units from siezing when the marine clay sets up, after the weekend shutdown, a mixture of diesel fuel and gasoline is poured around the siezed areas to loosen the material with the heat from the fired mixture. Another method, still unproved, is to pipe exhaust from the tractor under the Movall to heat the bed.

The joint venture of Peter Kiewit and Morrison-Knudsen puts track-type tractors on boards for the weekends to prevent the tracks from freezing to the ground. Canvas shields are used on track equipment.

Haulage units on the Morrison-Knudsen job at Gallop Island have

CONTRACTORS AND ENGINEERS

Caterpillar DW21 tractor with a C&D Movall is fill on the Grass River Locks excavation. The is equipped with a metal cab and engine side as a protection against the cold. The pipe the trailing unit heats the bed.



Heated oils and greases are being used in a Caterpillar DW21 and a C&D Movall, and coolant is added to the unit's radiator. A close watch of lubrication schedules keeps the equipment operating smoothly.

heated cabs, and its track-type tractors are equipped with canvas side curtains for engine and operator protection. At the present time, construction is proceeding on a building where equipment will be placed to heat the beds for the removal of frozen material from the beds.

Fuel with low pour point is being used on all of this equipment. Some of the larger engines in shovels and draglines are equipped with ether starting aids, but because this job has no engines requiring an ignition system, battery and distributor troubles have been avoided.

Dutcher Construction Corp., has found that heaters in hauling units are not much help. Cabs are provided for operators, but no engine shields are used on this job. Ether is used in starting engines in all equipment.

Peter Kiewit and Morrison-Knudsen, at Long Sault Dam, likewise use ether spray in air cleaners of equipment with direct electric starting. Barrels of denatured alcohol are on hand for use in fuel trucks at a ratio of five gallons of alcohol to 1,200 gallons of fuel. This fuel has a high kerosene content.

Greasing operations

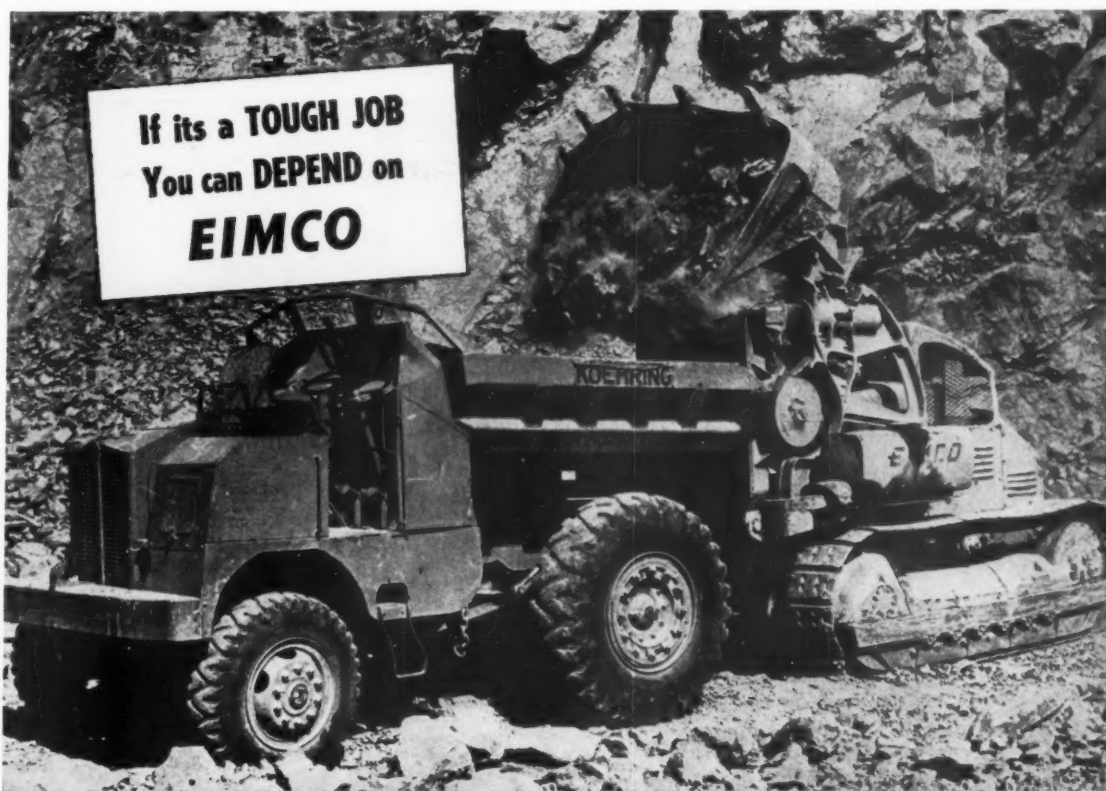
Track-type tractors at the Kiewit-Johnson & Johnson job at Iroquois Dam are filled with 50-weight engine oil in the final-drive compartments and 20-weight oil in the engine. The oil is changed every 100 hours. Filters are carefully watched because some oils pass through and their additives do not. This can happen when the oil has a low pour point and the additive does not.

At Gallop Island, Morrison-Knudsen is using a low pour point fuel on

all equipment, a 90-weight transmission oil, and a 20-weight engine oil. The engine oil is changed once a week.

Also using 90-weight transmission oil and 20-weight engine oil is the Dutcher Construction Corp. at Grass

(Concluded on next page)



Hard, Rough, Tough Jobs Need Eimco Dependability

This case study concerns one Eimco 105 loader on which an open pit mine depends for its entire production.

Location — in an isolated and remote area of Southwest Africa.

Conditions — dusty, dry and hot. Pit floor uneven-solid rock.

Mining — selective Operators — native Maintenance — Nil

Report — The Eimco 105 Tractor Excavator has operated some 3200 hours on consecutive two shift basis under the most difficult conditions. Native operators are unnecessarily abusive of the equipment. The ore is exceptionally abrasive and heavy. No other loading equipment is available so the Eimco must stay on the job. One operator ran the 105 a complete shift without fan belts, both of them run the machine to the solid rock wall and spin the tracks when cleaning out an ore pocket.

Eimco does not recommend abuse on their tractor-excavators or any other equipment but Eimco produces a machine that can stay on the job day in and day out—month in and month out—when you are depending on it and when plant capacity depends on a single production loading unit.

There are many reasons for Eimco superiority on the tough jobs. The design of an Eimco is simple-strong. The material of construction is all alloy steel. The operating features make it the easiest tractor to operate and the most maneuverable. When you need guts in a tractor, compare an Eimco with anything you are using or have used previously.



THE EIMCO CORPORATION
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa



9-173

For more facts, use Reader-Reply Card opposite page 18 and circle No. 206

A workman checks the antifreeze in a Caterpillar DW21 tractor. Dutcher Construction Corp., contractor on this phase of the job, also keeps ejectors from siezing by pouring a mixture of diesel fuel and gasoline around the siezed areas.

MARCH, 1956

(Continued from preceding page)

River; but Peter Kiewit and Morrison-Knudsen at Long Sault is using 10-weight motor oil.

All contractors are using track-roller grease, although Kiewit-Johnson & Johnson is considering using transmission oil for all greasing jobs. Kiewit-Johnson & Johnson equipment is greased twice a day, once after each 10-hour shift, and steering clutch greasing has been stepped up to four times a day. Morrison-Knudsen equipment is greased once a day, after the second shift.

Oil and grease schedules have not been stepped up in the cold weather at Long Sault Dam and Canal. Peter Kiewit and Morrison-Knudsen does this job with preheated track roller

grease once every 20 hours. For summer operation, chassis grease is used on all equipment.

Equipment working on the St. Lawrence Seaway project has operated satisfactorily all winter because of these well-planned schedules.

THE END

Handbook of research and development management

A survey of current research and development management techniques, "Common Sense in Research and Development Management," by George W. Howard, has been published by Vantage Press, Inc. The text emphasizes the common-sense approach to industrial research.

Nine chapters cover such subjects

as selection of personnel, organization, professional development, direction, planning and checking progress, internal communications, and services in research and development. A glossary of terms and a list of research developments are also given. A sample questionnaire used in determining the feeling of personnel toward their work is included in the appendix.

Priced at \$2.75, the book may be obtained from the publisher, Vantage Press, Inc., 120 W. 31st St., New York 1, N. Y.

Corps of Engineers assigns two engineers

The Seattle District of the U. S. Army Corps of Engineers has reas-

signed two engineers to posts within the district. Kenneth T. Coffman, a civil engineer from the district headquarters office, has been named acting project engineer at Albeni Falls Dam. He relieves James F. Grafton, who has been appointed project engineer for the Eagle Gorge Dam.

Three specialists have also been engaged as consultants on the Eagle Gorge Dam to be constructed on the Green River in western Washington. They are I. C. Steel, San Francisco, Calif., dam-design specialist; Dr. A. Casagrande, professor of soils mechanics at Harvard University; and James P. Growdon, a hydraulic engineer specializing in rock-fill dams with sloping, impervious earth cores.

Cleaver-Brooks organizes new marketing corporation

A new corporation to expedite marketing of products in the western hemisphere has been established by the Cleaver-Brooks Co., Milwaukee, Wis., manufacturer of self-contained steam and hot-water boilers, industrial oil burners, evaporators, distillation equipment, and heating equipment for road construction and ready-mix plants.

The new firm, Cleaver-Brooks Western Hemisphere, Ltd., will service all countries in the hemisphere.

Manual cutters for asbestos-cement pipe

Field cutting of asbestos-cement pipe by manually operated cutters is the subject of a folder from Pilot Mfg. Co. Illustrations point out a large model which cuts up to 20-inch nominal pipe sizes, and a junior model which can be used on both pressure-pipe and flue-pipe in sizes through 6-inch nominal, and asbestos-cement electrical conduit.

To obtain this folder write to Pilot Mfg. Co., 3970 Pacific Coast Highway, Torrance, Calif., or use the Request Card at page 18. Circle No. 91.

Maintenance coating

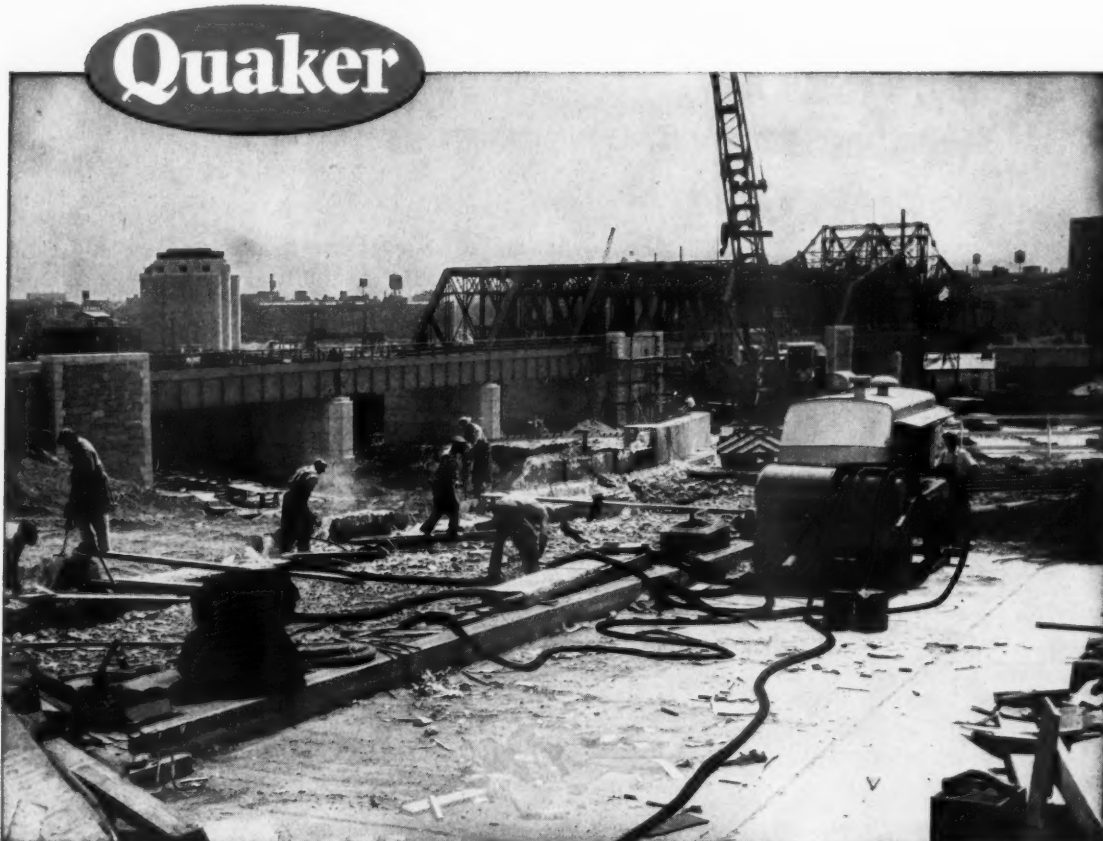
Gaco N-700 liquid air curing neoprene, which may be applied by roller, brush, or spray, is featured in a bulletin from Gates Engineering Co. This compound is said to resist corrosive fumes, splash, and weathering. According to the company, it protects ducts, tank exteriors, structural steel, railings, and old and new equipment.

To obtain this bulletin write to Gates Engineering Co., P. O. Box 1711, Wilmington, Del., or use the Request Card at page 18. Circle No. 23.

Heating and power boilers

The Koehring-Watrous line of heating and power boilers is described in a new catalog. A boiler-selection guide contains a reference chart based on output requirements, as an aid in determining boiler sizes and types for any specific situation.

Easily adapted for use with oil, gas, wood, or mechanical stokers, the boll-



Rugged, non-twisting air hose for your toughest drilling and digging problems



Your fastest supply source is your industrial supply distributor. Save time by purchasing Quaker-Quaker Pioneer products through him. You'll find him prompt and efficient in meeting your regular needs—and mighty helpful when emergencies occur. Write for free brochure and name of your distributor.

No matter what the job: boring into rock, breaking through shale, biting into concrete . . . no matter what the weather: wet, frigid or torrid . . . this tough air hose gives the utmost in stamina, dependability and easy handling.

Size for size this hose is stronger than other hose of equal capacity. Though light weight for easy handling, it will not snake or twist under pressure. Stands up to dragging over jagged surfaces, resists oil damage and withstands cracking at temperatures as low as -40°. Tube is non-porous and oil-resistant. On almost any hose installation you count on excellent performance with this hose—part of a proven line of rubber products, including belting, packing, and moulded rubber for every use.

HKP
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QUAKER RUBBER DIVISION
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San Francisco 7, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 207

ers are built in accordance with Canadian Inter-Provincial regulations and ASME code specifications. To obtain this catalog write to Koehring-Waterous, Ltd., P. O. Box 607, Brantford, Ontario, or use the Request Card at page 18. Circle No. 99.

New address system based on east-north location

A radical new system of locating addresses, made to order for the person "with no sense of direction," has been introduced by Ambrose Ryder in a 48-page handbook entitled "Where Is Where." Known as the East-North Address System, the method replaces standard street and house-number addresses with designations based on longitude and latitude. A two-number figure represents the lot number, and hyphenated figures represent decimal values.

The system would require a set of maps for each city or geographical location. Based on the theory that people remember numbers, the system attempts to eliminate hit-or-miss and bloodhound methods of finding places. Conversion tables, to simplify mathematical interpolations, will be issued with the maps.

The system, according to Mr. Ryder, will not only simplify locations on an individual scale, but also will facilitate mail deliveries and sign-post reading.

Mr. Ryder has hopes of the method's being adopted on a world-wide scale.

Illustrated with maps and charts, the booklet may be obtained for \$1 from the publisher, the Carmel Co., Carmel, N. Y.

Line of hose couplings

■ A catalog describing the complete line of Le-Hi high and low-pressure hose couplings is available on request. Specialized couplings for air hammers and a variety of air-hose couplings are included. Other couplings in the line are suitable for widely divergent applications ranging from hoses for small welding units to giant high-pressure steam hoses.

Also shown are hose nipples, menders, hose clamps, and long-shank malleable-hose couplings.

To obtain Catalog No. 644-A write to Hose Accessories Co., Lehigh Ave. at 17th St., Philadelphia 32, Pa., or use the Request Card at page 18. Circle No. 45.

Tips on servicing tubeless truck tires

■ A booklet from B. F. Goodrich Co. tells how to mount, demount, and repair tubeless truck tires. Offered as original equipment on many 1956 trucks, tubeless tires provide several advantages. These include the elimination of tube and flap problems, weight reduction that permits bigger payloads, and ease in maintenance.

To obtain this booklet write to B. F. Goodrich Co., 500 S. Main St., Akron 18, Ohio, or use the Request Card at page 18. Circle No. 107.

For more facts, circle No. 208→

Film on WASHO road test

A film showing the operation and major findings of the WASHO Road Test has been released by the Bureau of Public Roads. The test, a joint undertaking of the Bureau of Public Roads, the Western Association of State Highway Officials, and the motor-vehicle and petroleum industries, was performed to determine the effect of heavy traffic on bituminous pavements.

Entitled "The WASHO Road Test," the 16-mm, sound-color film is a visual summary of published reports of the test.

The film may be borrowed by responsible organizations by contacting either the Research Reports Branch, Bureau of Public Roads, Washington 25, D. C.; the Division Engineer, Bureau of Public Roads, 753 Morgan Bldg., 720 S. W. Washington St., Portland 8, Oreg.; or the Division Engineer, Bureau of Public Roads, 102 Old Mint Bldg., 5th and Mission Sts., San Francisco 3, Calif.

"The WASHO Road Test" may be purchased from R. E. Royall, chief, Research Reports Branch, Bureau of Public Roads, Washington 25, D. C., for about \$130. The request for purchase must include this statement:

"Assurance is hereby given that the composition of the motion picture will not be altered in any way, either by addition or deletion, and that it will be shown only in its entirety."

New Buck representative

The Buck Equipment Corp., Cincinnati, Ohio, has named David Locke its direct representative in Delaware, Pennsylvania, Maryland, southern New Jersey, and Washington, D. C.

He has previously been associated with the Equipment Rental Co. of Pittsburgh, Pa., a distributor of Buck products.

Exposed bearings are protected from any weather damage by Bentone grease

Changes to
BENTONE*-based grease . . .

FLEET OPERATOR
SAVES \$204 PER TRUCK
IN BEARING REPLACEMENT!

Service Lumber Company used ordinary greases in its bulk-handling truck fleet and had to replace four \$8.50 conveyor system bearings in each truck every month. Then the firm changed to Bentone*-based grease. Result: *No bearing failure for six months . . . a \$204 savings per truck.*

The operator reports Bentone*-based grease:

- cuts grease consumption in half
- stays in place in all weather
- resists wash-out

You can get the same kind of results — by using lubricating grease compounded with Bentone* 34.



For additional information contact your local supplier as listed in the attached column or write to National Lead Co. • Baroid Division

BENTONE* 34
FOR MULTI-PURPOSE GREASE

NATIONAL LEAD COMPANY • BAROID DIVISION
P. O. BOX 1675
HOUSTON 1, TEXAS



Truck operators report Bentone grease "stays put," resists extreme temperatures, dust, wash-out and abrasives

Texas fleet truck operator says Bentone grease cuts lubrication costs in half.



Just before the presentations, the 1955 Beaver president chats with three of the award winners. Left to right are William A. Johnson, outgoing president; H. W. Morrison; Harvey Slocum, and Henry J. Kaiser, Jr. Morrison and Kaiser won management awards, Slocum a supervision award.

Beavers make first award

Gold trophies for outstanding work in four phases of construction were given to sixteen men at the first annual awards dinner held by the Beavers, January 28 in the Hotel Statler in Los Angeles.

Altogether, 850 contractors, engineers, superintendents, and suppliers were present as the honors were conferred on many of the men who worked on Grand Coulee and Hoover dams and other western projects. The Beavers, conceived along lines similar to The Moles, has a membership limited to contractors and suppliers having main offices located west of the Mississippi River, or others who undertake major projects in the west. The organization was formed in 1955.

Four classifications

The first annual award covered four classifications important in heavy construction—management, supervision, engineering, and supply.

Management awards went to Guy F. Atkinson of Guy F. Atkinson Co., South San Francisco, Calif.; Herman Brown of Brown & Root, Houston, Texas; Henry J. Kaiser of Henry J. Kaiser Co., San Francisco; and Harry W. Morrison of Morrison-Knudsen Co., Inc., Boise, Idaho.


Supervision honors were bestowed on Harvey Slocum, Lee T. Grider, Woody Williams, and C. W. Wood. Engineering achievement recognition went to Julian Hinds, B. F. Jakobsen, and Maj. Gen. Thomas M. Robins (Ret.) of the U. S. Army Corps of Engineers. Supply awards went to N. A. Bowers and J. S. Foster, the latter the chief engineer and vice president of Lidgerwood Manufacturing Co.

While The Beavers awards are primarily intended to honor men still living, several presentations were made posthumously. These went to John P. Shirley of Gunther & Shirley, Los Angeles; management; William R. Ellis of Hercules Powder Co., supply; and Guy LeRoy Stevick of fidelity & Deposit Co. of Maryland's western area, supply. Stevick was the originator of joint-venture bonding, which was first tried on Hoover Dam and is now commonplace on big projects.


Business discussed unofficially

Construction industry leaders voiced optimistic predictions for the immediate future at a special press conference held in advance of the awards banquet. Commenting on the possibility of a major highway program being approved by Congress, H. W. Morrison of Morrison-Knudsen Co., Inc., said "I do not believe it will be the comprehensive highway program originally proposed by the Eisenhower administration, but it seems reasonable to expect something in the nature of 50 to 60 per cent of that program." He stated that it

CONTRACTORS AND ENGINEERS



MIXING ASPHALT with PROFITS



MADSEN 2000-LB. SPECIAL ASPHALT PLANT



Equipment that Serves

• The MADSEN 2000-lb. SPECIAL is offered as a complete asphalt mixing plant. The main units consist of the hot stone elevator; the basic frame which supports and ties-in the mixer, weigh-box, bin, screen, asphalt bucket, aggregate and asphalt scales, and the drive center; the stairway, platforms and controls; the MADSEN Counter-Flow Dryer; and the MADSEN Dust Collector Unit.



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MADSEN PRODUCTS FOR THE ASPHALT PAVING INDUSTRY

ASPHALT PAVING PLANTS — 1000-LB. TO 6000-LBS. BATCH CAPACITY • PUG MILL MIXERS • AGGREGATE DRYERS • ASPHALT TANKS
DUST COLLECTOR UNITS • ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS
ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 209

Western contractors honor men for outstanding awards and achievements

seemed fairly certain that bond financing will not be used.

"Whatever program is authorized probably will be paid for through increased taxes on gasoline, diesel fuel, tires, and automobiles," Morrison added. He looks for a program that will continue, in recognizable form, present federal-aid methods of highway construction.

Guy C. Kiddoo, vice president of the First National Bank of Chicago, also felt the outlook was cheerful. "As the nation's population grows," he said, "so does its need for better highways, schools, industrial plants, airfields, and water supplies." One of the big construction challenges of this age is a "dependable water supply for the south and southwest," Kiddoo told the contractors, adding that "I expect some day to see you bring water from the Great Lakes to Texas, from the Columbia River to California."

Kiddoo urged contractors to give the public all the facts about their profits, in order to dissipate the current public feeling that works projects cost too much. No business today shows a smaller average profit than construction, Kiddoo pointed out. He compared its 1½ per cent net profits with those of 3 to 4 per cent in many other industries. No business in the country, he declared, is so free from government influence, so filled with risk, or so rewarding in personal satisfactions. He also warned that fewer than 20 per cent of construction firms are still active 7½ years from the date they started, and he urged contractors to think in terms of higher profits whenever possible.

United States construction know-how is recognized even by the Russians, said Harvey Slocum, one of the world's outstanding dam builders. Slocum's current job—India's Bhakra Dam—recently was inspected by Nikita Khrushchev and Premier Bulganin of the USSR, who came away impressed by what the Indians had accomplished with American supervisory help.

"I believe that Khrushchev is experienced in construction," Slocum said. "In fact, he told me through his interpreter that some years ago he was connected with construction of the Moscow subway. I noticed that he didn't miss very many tricks as far as construction at Bhakra was concerned."

New officers

The 1956 Beavers officers include L. E. Dixon of San Gabriel, Calif., president; George H. Atkinson of South San Francisco, senior vice president; and John A. Kier, vice president. James L. Lovell continues as ambassador of good will.

THE END

For more facts, circle No. 210→

MARCH, 1956

ARBA Road Show material is now available

The Publicity Committee for the 1957 ARBA Road Show has now free advertising material available to manufacturers and dealers. The material, which is an aid in promoting the show, consists of small pictures, stickers for letterheads and other mailing material, envelope stuffers, and reprints.

Complete information may be had from the American Road Builders' Association, World Center Bldg., Washington 6, D. C., or from the publicity committee, 155 N. Wacker Drive, Chicago 6, Ill.

Harvey A. Scribner is chairman of the publicity committee.

Crushers and screens

■ Reliance road-building maintenance and quarry equipment is fea-

tured in a catalog from Universal Road Machinery Co. The models shown are: portable and stationary bins, crushers, portable crushing units, conveyor belts, elevators, feeders, screens, sweepers, and washing screens. Along with each item is a picture, diagram or flow chart, and a brief description.

To obtain Catalog 52 write to Universal Road Machinery Co., Kingston, N. Y., or use the Request Card at page 18. Circle No. 70.

RUGGED D8S 'DOZE ROCK on road to Donnells Dam



In rough mountain country above Strawberry, California, Tri-Dam Constructors are preparing for the \$32,000,000 job of building Donnells Dam.

One of the first requirements is an 8-mile, 24-foot contour road leading up to the dam site and permanent camp. And most of the roadway has to be blasted out of steep granite slopes like the one pictured. Handling shot rock on locations like this takes tough equipment. That's why Tri-Dam is using CAT* D8 Tractors with No. 8S Bulldozers. There are 9 of them working on the project.

The D8 has been known as "king of the crawlers" for years. As jobs grew bigger and tougher, the tractor has grown with them. Today's D8 is new from the ground up—bigger, tougher, more powerful than any earlier model. Look at these features:

- New heavy-duty 4-cycle diesel engine delivering 191 HP at 1200 RPM.
- Choice of torque converter or direct drive.

- Oil clutch, for smooth performance and long work life.
- New 7-roller track frame and long-wearing "water quenched" track shoes.
- New, more powerful starting engine with "in-seat" starting.
- Better job visibility and greater operator comfort.

Your Caterpillar Dealer will be glad to show you how this new D8 can increase your production. And you can depend on him for prompt service and original parts. Ask him for a demonstration today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

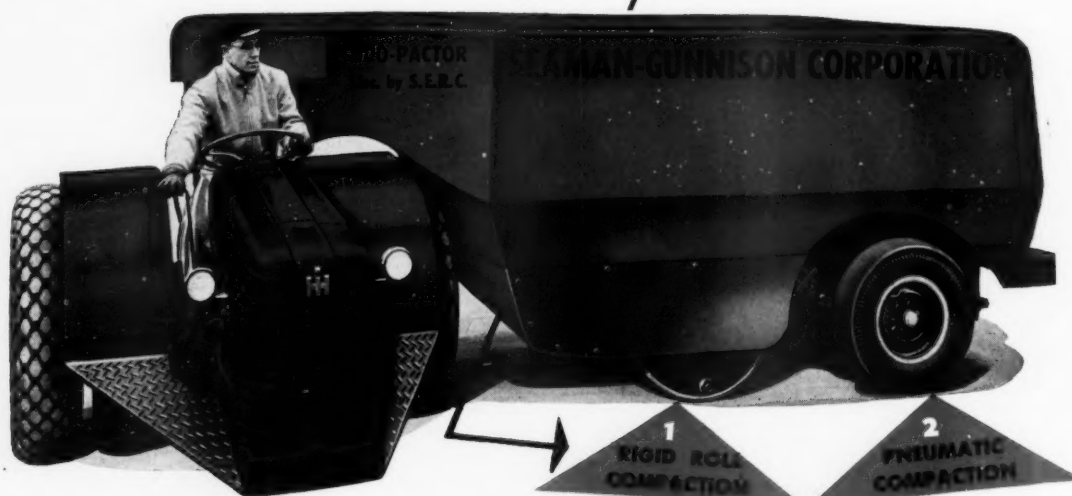
*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE

Rough roads serve a purpose at multimillion proving ground

Equipment does 5 million-yard earthmoving job in two months;
80,000 tons of blacktop, 200,000 feet of concrete are required

NEW CORPORATION SEAMAN-GUNNISON OF BARABOO, WISCONSIN DUO-PACTOR



Now, two compaction methods in one machine . . . an advantage found *only* in the Seaman-Gunnison Duo-Pactor. Unit offers pneumatic compaction through eight oscillating, spring-mounted wheels and rigid roll compaction to "iron out" the ridges left by rubber-tired rolling. Operator uses either of the two rollers independently or together . . . hydraulically selective. In addition, the Duo-Pactor offers these advantages:

- 86 in. pneumatic rolling width; steel roller width 72 in.
- Complete turn-arounds, without backing, on 19-ft roads.
- Widest gross weight range of any roller built . . . 6 to 19 tons, sand and liquid ballasting.
- International "300" prime mover; 4 ft dia. drive wheels for maximum traction.
- Full power hydraulic steering through 180°.

Write today for complete specifications and details.

Seaman-Gunnison Corp.
BARABOO, WISCONSIN



Spring-mounted
oscillating
wheels knead
road surface.

COMPRESSION in lbs per lineal inch

	Empty	Fully Ballasted
Steel	104	425
Rubber	94	400
Both Steel and Rubber	50	200
Drive Roll	150	300

MAIL COUPON for Details

Seaman-Gunnison Corporation

Baraboo, Wis.

Send complete specifications on new

Seaman-Gunnison Duo-Pactor

Name

Firm

Address

City Zone

State

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 211

Roadways ranging from average to bad, some of them with grades up to 25 per cent and some of them with superelevated curves to permit vehicles to skim along at 140 mph, are being pushed to completion at Romeo, Mich. And though it may be difficult to believe, a highly competent engineering staff is in charge of the work.

These roadways are being built by S. J. Groves & Sons, Inc., Minneapolis, Minn., for the multimillion-dollar Ford Motor Co. proving ground, which has been designed to test the safety features of new Fords. Included in the facility is a 5-mile oval-shaped high speed track, a basic durability road, a gravel durability road, a hill durability road, and a number of test grades. Office buildings and storage facilities will also be provided at the site. The high-speed concrete-paved track and straightaway are expected to be finished by the end of the summer, but asphaltic paving on basic and hill durability roads has already been done. Paving is being done under a subcontract by Alexander Construction Co., Minneapolis.

Big earthmoving job

A spread of 88 pieces of earthmoving equipment, working two 10-hour shifts, completed the 5 million-cubic-yard grading job about two months ago. Of this total, about one-fifth consisted of peat that had to be wasted. Six draglines, 23 Euclid bottom-dumps, 38 bulldozers, and 21 scrapers handled this work. Two major cuts were in the high-speed oval, one consisting of 700,000 yards of material, the other consisting of 600,000 yards. The largest of the major fills required 1,100,000 yards of earth; another involved placing 163,000 yards of material over a distance of 1,000 linear feet.

Armco corrugated metal structures, including corrugated metal pipe and Multi-Plate in sizes ranging from 15 to 90 inches in diameter, were installed under the various roads to provide drainage. Pipe arch was installed under pavements having low headroom.

A total of more than 80,000 tons of bituminous concrete and aggregate binder were required for paving the basic and hill durability roads. Gravel was laid on the third durability road, which is 8.05 miles long.

The basic durability road, 7.2 miles long, is designed for 25,000 mile en-

CONTRACTORS AND ENGINEERS

A Galion roller works on the bituminous concrete surface of the basic durability road at the proving ground. In this section, Armco Multi-Plate pipe-arch was installed for a stream crossing.



duration runs. This road has sharp curves and dips, and bumps were even paved into the road. The 2.3-mile hill durability route has grades up to 25 per cent. A special maximum grade of 60 per cent was built up in one section to test military vehicles.

Concrete track

Almost 200,000 square feet of concrete is being required by the reinforced 9-inch-thick slab for the high-speed track and the straightaway. The track will be a 5-mile oval with a 2,500-foot radius. Its five lanes of roadway bring its width to 60 feet. Superelevated curves on this track required high banks to be built so that the outer edge of the pavement is 11½ feet higher than the inner edge. At each end of the 2½-mile straightaway will be 200-foot turn-around pads.

Personnel

Planning and layout of the proving grounds was done by the Ford engineering staff, while engineering was done by Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa. The resident engineer on the project for the Ford Motor Co. is W. G. Cookman. Superintendent of the job is C. W. Kerns, and the project engineer for the prime contractor, S. J. Groves & Sons, Inc., Minneapolis, Minn., is S. R. Shoenfelt.

THE END

Construction Machinery sells affiliate interest

The Construction Machinery Co., Waterloo, Iowa, has sold its interest in the Construction Machinery Sales Co., also of Waterloo. The sales organization has been an affiliate of CMC since 1945.

To avoid confusion between the two firms, the Construction Machinery Sales Co. has changed its name to Engineered Equipment, Inc., and will operate under separate ownership and management.

CMC will continue to manufacture Transcrete truck mixers a line of other mixers, and pumps.

Heede opens branch office

B. M. Heede, Inc., Long Island City, N. Y., has opened a west coast operations office at 260 Kearney St., San Francisco, Calif. The new branch will handle rentals of Concretor hydraulic jacks and slip-form equipment.

MARCH, 1956



RUGGED WAGNER EQUIPMENT

makes a tractor your most versatile and inexpensive construction tool

Now a tractor can be the most important single tool on your construction jobs. When it's teamed up with rugged Wagner tractor equipment, nothing else can do so many jobs so well.

By equipping a tractor with a Wagner Backhoe you make short work of digging footings, sewer, gas and power trenches and septic tanks. Likewise a tractor and a Wagner loader do a faster,

better job of land clearing, excavating, back-filling and landscaping. And all the while you'll be speeding construction, saving man-hours and increasing profits.

Check with your nearby Wagner dealer to see how Wagner tractor equipment can cut time and labor costs on your construction jobs.

	WAGNER IRON WORKS, 1905 South 1st St., Dept. 22 Milwaukee 1, Wis.
	Send me more information on Wagner Tractor Equipment for a _____ tractor. (make)
NAME _____	
COMPANY _____	
ADDRESS _____	
CITY _____ STATE _____	

"WAGNER BUILT" MEANS "BETTER BUILT" FOR OVER 105 YEARS

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 212

names in the news

NCA elects president

C. D. Haxby has been elected president of the National Constructors Association, an organization of engineering and building firms engaged in the design and erection of petroleum refineries, steel mills, chemical and power plants, and other industrial facilities. The president of the Rust Engineering Co., Pittsburgh, Pa., Mr. Haxby succeeds T. C. Williams in the post.

Elected as vice president was Carl B. Whyte, president of Procon, Inc.,

Des Plaines, Ill. Paul S. Klick, Jr., of the Foster-Wheeler Corp., New York, N. Y.; G. I. Seybold, Chemical Construction Corp., also of New York; and H. A. Denny of Koppers Co., Pittsburgh, Pa., were elected to the executive committee.

N. Y. Trap Rock elects assistant vice president

John R. Kringel has been appointed assistant vice president of the New York Trap Rock Corp., New York, N. Y. In his two years with the organization, Kringel has served as superintendent of the Haverstraw plant and as assistant to the vice president of operations.

In his new position, Kringel will be responsible for field operations.

Ohio Turnpike appoints executive assistants

The new assistant to the executive director of the Ohio Turnpike Commission is C. E. Westervelt, Jr. V. O. Robertson will serve as administrative assistant to the executive director. Mr. Westervelt, an attorney, has been associated with the commission's legal department since 1953.

Morton takes office as highway commissioner

John O. Morton has been sworn in as commissioner of public works and highways for the state of New Hampshire. With the department since 1922, he has been deputy commissioner and chief engineer for the past five years.

John O. Morton, commissioner of public works and highways for the state of New Hampshire.



Mr. Morton succeeds Maj. Gen. Frank D. Merrill (ret.) who died in December, 1955.

Asphalt Institute names new officials

Robert B. McKeagney, former New England district engineer, has been



Robert B. McKeagney, now serving as deputy division engineer of the Atlantic-Gulf Coast Division of the Asphalt Institute.

promoted to the post of deputy division engineer of the Atlantic-Gulf Coast Division of the Asphalt Institute, College Park, Md. He will make his headquarters in New York.

Mr. McKeagney will serve as an aide to Herbert Spencer, division engineer, and will succeed to the post of division engineer when Spencer retires in July.

A member of the U. S. Army Corps of Engineers for 12 years, Mr. McKeagney served as chief of the paving and materials section of the East Ocean Division.

Vaughn Marker, asphalt-paving specialist with the California Division of Highways, has joined the Asphalt Institute as district engineer for the coastal counties in that state. He will work directly under the supervision of B. A. Vallerger, Pacific Coast managing engineer.

A civil engineering graduate of the University of Nevada, Marker has also served with the headquarters construction department of the California Division of Highways.

John F. Pearring has been named Denver district engineer for the Institute. He succeeds the late John Banning.

Formerly district maintenance engineer for the Idaho Department of Highways, Pearring will serve directly under the midwest district engineer. His territory embraces Colorado, Utah, Wyoming, Idaho, and Montana.

Corps of Engineers makes reassignments

Col. Herrol J. Skidmore has been appointed district engineer at Huntington, W. Va., for the U. S. Army Corps of Engineers. He will assume his post on May 1.

Now deputy engineer, Headquarters, Seventh Army, U. S. Army, Europe, Col. Skidmore succeeds Col. George T. Derby. A graduate of the U. S. Military Academy, West Point, he served as assistant to the chief engineer, and executive officer to the chief engineer

NEW!



a 900 cfm GYRO-FLO

HAS BEEN ADDED TO INGERSOLL-RAND'S

COMPLETE LINE OF PORTABLE ROTARY COMPRESSORS

Now there are 5 sizes . . . 125, 210, 315, 600 and 900 cfm.

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10 JACKHAMMERS



7 WAGON JACKS WITH LIGHT DRIFTER



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There's only one GYRO-FLO . . .
Ingersoll-Rand's Rotary Portable
Compressor . . . Introduced in 1950

IN THIS new addition to the time-tested GYRO-FLO line, Ingersoll-Rand brings you a heavy-duty compressor that delivers a full 900 cfm at 100 psi — yet weighs only 14,340 pounds ready-to-go, and is but slightly larger than the famous GYRO-FLO 600.

The smooth, dependable and virtually maintenance-free performance of the GYRO-FLO rotary compressor is a matter of record on drilling and construction projects the world over. When you have a job calling for 900 cfm of air power, ask your Ingersoll-Rand representative to tell you more about this new, heavy-duty GYRO-FLO 900.

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AN UNBEATABLE COMBINATION . . . GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

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in Australia, and also as commanding officer of the 96th Engineer Regiment in New Guinea during World War II.

Lt. Col. John S. Hassell has been assigned as area engineer at Thule Air Force Base in northern Greenland. Recently he has served in the Panama engineer district, in San Juan, Puerto Rico, part of the Jacksonville district, and later at Homestead Air Force Base in Florida. Here he was first project engineer and then resident engineer.

During World War II, he served in the Pacific.

Byron E. Clark, a civil engineer with the Seattle District of the U. S. Army Corps of Engineers, has assumed new duties as chief assistant to the officer in charge of the civil engineering section in the 13th Coast Guard District Office in Seattle. Clark had formerly been a special assistant in the engineering division of the Seattle office.

Clark will be succeeded in his former post by M. E. Buckman.

Crow elects new member to board of directors

James Conforti, Jr., for the past five years chief engineer and treasurer of the William L. Crow Construction Co., New York, N. Y., has been elected to the firm's board of directors.

During the Second World War, he served as a lieutenant commander with the Seabees.

Baltimore Contractors elects two new officers

Paul E. Tignor and Albert C. Klingenberg have been appointed to two newly created vice presidential positions with Baltimore Contractors, Inc., Baltimore, Md. Klingenberg was formerly the firm's director of sales, planning, and engineering. Tignor had been responsible for the production, engineering, and shop departments.

Gen. Prentiss to become ARBA executive director

Maj. Gen. Louis W. Prentiss, who retires from the U. S. Army next



Louis W. Prentiss, who will be the new executive vice president of the ARBA.

month, has been named as the new executive vice president of the American Road Builders' Association, a national organization representing all branches of the highway-construction industry. In taking over the post on May 1, he will succeed Lt. Gen. Eugene Reybold (ret.).

As executive vice president, he will be responsible for the administration of the association's affairs on the national level. Gen. Prentiss, a graduate of the Colorado School of Mines, has served in several capacities with the

U. S. Army Corps of Engineers. Since 1954, he has been in command of the Engineer Center at Fort Belvoir, Va.

Moles honor two engineers

The Moles, a society of heavy-construction men, honored two engineers at a formal dinner in the Waldorf Astoria Hotel on February 2.

The awards are presented annually to one member and one nonmember of the society. This year's member award went to Howard L. King, vice president and chief engineer of Mason & Hangar Co., New York, N. Y., for his work on the Holland, Lincoln, and Brooklyn-Battery Tunnels.

Harvey Slocum, now working on the Bhakra Dam in India, was the winner of the nonmember award.



Pictured at The Moles' recent awards dinner are (left to right) A. Holmes Crimmins, president of the society; Harvey Slocum, nonmember winner; Howard L. King, member winner; Benjamin F. Fairless, president of the American Iron & Steel Institute and chief speaker at the gathering; and Eugene F. Moran, Jr., chairman of the awards committee.

HOW'S THIS FOR PROFITABLE AGGREGATE PRODUCTION?

- Output per 10-hour day—
200 T. of-1/8"; 300 T. of-1/2";
500 T. of-1"; 400 T. of-1 1/4";
600 T. of-1 3/8"; 400 T. of-3".
- Total daily production—2400 Tons
- Material—Quarry-run limestone
- Silica content—Approximately 16%

"Our CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKER is doing a real job"

Says Edgar N. Putman, Supt.
NEW HOPE CRUSHED STONE & LIME CO.
New Hope, Pa.

Take it from this quarry operator—producing six sizes of specification material at a steady 240 ton per hour clip is profitable production! "With our 4350H Impact Breaker we're getting good breakage, ample crushing capacity, and operating costs are low," says Edgar Putman.

In addition to the Cedarapids Double Impeller Impact Breaker, the New Hope plant includes a 40' x 12' heavy-duty cast steel Apron Feeder and three Horizontal Vibrating Screens—all Cedarapids!



WHAT'S YOUR PRODUCTION PROBLEM?

If you need output of 240 tons per hour, 40 tons per hour, or 800 tons per hour—of finished product ranging from aglime to riprap—there's a Cedarapids portable or stationary aggregate plant built to produce the tonnage you want at the low cost that means extra profit. If you produce bituminous concrete, check the complete line of Cedarapids batch-type and continuous-flow type plants.



IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 214

Highway Research Board holds equipment panel

Contractors, manufacturers, and engineers discuss earthmoving and compaction equipment at 35th annual HRB meeting

For the first time in the history of the Highway Research Board's annual meetings, a session on highway equipment included a panel discussion on earthmoving and compaction machinery.

Another precedent was also broken as this 35th yearly gathering was held entirely under one roof at the Sheraton-Park Hotel, Washington, D. C., January 17 to 20. Heretofore, the HRB meetings were held in the cramped quarters of the National Academy of Science and a number of government buildings in Washington. Some 1,500 of the nation's leading highway technical experts attended the four-day convention, during which nearly 200 papers were presented at 36 general sessions. (For a report on the presentation of annual awards at the meeting see "Top HRB Awards go to Highway Engineers", C&E Feb., 1956, pg. 147.)

Highway Equipment

Presiding over the Highway Equipment session was Harold F. Hess, executive vice president of the Construction Industry Manufacturers Association. CIMA is the equipment manufacturers' division of the American Road Builders' Association. Participants in the panel discussion on earthmoving and compaction equipment included two contractors, two engineers, and two manufacturers' representatives. They were: John P. Moss, Moss-Thornton Co., Leeds, Ala.; J. P. McInnes, C. J. Langenfelder & Sons, Baltimore, Md.; Walter Van Buck, U. S. Bureau of Public Roads; Howard R. Craig, engineer of construction, Ohio Department of Highways; E. E. Howard, Caterpillar Tractor Co.; and R. P. Jones, Harnischfeger Corp.

Panel opinions

Federal highway engineer Walter Van Buck of the BPR opened the panel with the admonition that highway design and specifications must keep abreast of equipment development. As an example of such relationship, he suggested that thicker lifts might be placed in embankment fills to take advantage of the heavier compactors that are now available to contractors. Newer and better equipment will be forthcoming, Van Buck felt, in view of the accelerated national road program. Lower unit prices should be realized, the BPR representative declared, if there is more uniformity in highway design and specifications. He also stated that contractors can reduce costs by the better use of equipment.

Contractor John P. Moss, president of his own company and president also of the ARBA Contractors Division, pointed out that the bank of

equipment the average contractor has on hand is becoming obsolete because of the newer specialized machines that are continually introduced. No longer can this old bank of equipment be used, he warned, to effect

savings tax-wise as depreciable machinery. The Alabamian urged manufacturers not to rush new equipment through to contractors until the units are ready and fully tested. He said that he realized there was a fertile

field for new equipment and unless contractors adapt themselves to its usage "they will be outmoded, outclassed, outbid, and eventually—out".

Next to air his views was R. P. Jones of Harnischfeger who told the large audience that despite rising prices in construction, the cost of earthmoving and excavating today is the same as it was in 1943. Manufacturers should be commended for this gratifying phenomenon, according to Jones, because of the efficient machinery they are producing. While there is nothing new in the lift and swing actions of power cranes and shovels, Jones declared, designers of



TRENCHING 8 MILES through hard shale at Little Rock Air Force Base at Jacksonville, Arkansas, the powerful American Backhoe turned out steady production without costly maintenance delays. "Our American chewed through

that hard shale day in and day out without a single hour of downtime," Bruce Bird, Project Engineer, says. Also trenching, concrete storm drain pipes from 12 to 96-inch diameters were placed atop 20 inches of tamped backfill.

AMERICAN DIGS THROUGH HARD SHALE WITH "NO DOWNTIME"



"Our two American 300 Series Backhoes have been real producers even in the eight miles of hard shale encountered at the Little Rock Air Force Base Project," says Bruce Bird, Project Engineer for T. F. Scholes, Inc. "With American's dipper pitch bar arrangement, we adjust the dipper pitch for best results in any type soil," Bruce says. "This way, the operator gets faster digging action and makes more swing-dump cycles per hour without spillage—the kind of production you have to have to make money."

One of the country's leading contractors, T. F. Scholes, Inc., has found that American's rugged design, trouble-free transmission assembly and fine engineering not only reduce maintenance costs, but result in dependable, low-cost production.

"FASTEST PRODUCING BACKHOE we've had on any job," says Project Engineer Bird. "The American's controls are right where they need to be for fast, easy handling, and, with anti-friction bearings in the boom linkage, our operators turn out a big day's work without being tired."

equipment are constantly striving to increase a machine's capacity in relation to its weight. The larger the machine, the more economically it can move material is his theory.

Moving the machine itself is a problem, he conceded, and units should be built for easy dismantling in order to move them over the highways. If maximum highway load limits were standardized throughout all the states, equipment could be moved easier, Jones stated. Designers too, he went on, could develop units that could be broken down into their component parts. Big machines are needed, he emphasized, so that a con-

tractor can use them to reduce costs. In summing up, the Harnischfeger representative said that contractors, engineers, and manufacturers can help each other in keeping excavation costs down.

According to Howard R. Craig, Engineer of Construction, Ohio Department of Highways, the specifications in his state are concerned with the results required rather than the methods to be used. These specifications are reviewed every two years and a new set is issued incorporating necessary changes. Craig declared further that the use of larger earthmoving and compacting units in Ohio

has kept grading costs from rising. "We would not be able to build the roads we do in our state," he affirmed, "if we had not adopted moisture and density control practices some twenty years ago."

Equipment improvements

The other contractor representative on the panel, J. P. McInnes, praised such recently developed equipment features as larger tires, additional horsepower, faster loading, faster transporting speeds, and wider treads on crawler tractors that permit work to be done despite poor soil conditions. He singled out the Buffalo-

Springfield K-45 Kompactor as an efficient combination of the smooth-wheel and sheepsfoot rolling unit, pointing out that it operates at a speed of 4 to 5 mph. He suggested that the tractor-drawn 50-ton pneumatic-tire rollers would have to be made to work faster, for the sake of efficiency, as would also the self-propelled vibratory tamperers.

Other improvements, according to McInnes, can be achieved by the more efficient and economical moving of heavy shovels. He pointed out that the cost of moving a 4-yard shovel a distance of 100 miles is \$6,000 to \$7,000. Also, the machine must be broken down into four component parts for transportation, and highway-load limits must be observed in hauling operations. The contractor spokesman also said he favored thicker lifts in fill work when suitable material was used.

E. E. Howard of Caterpillar discussed construction techniques that have resulted from the contractor, engineer, and manufacturer working closely together. He admitted that the selection of equipment, now a major problem for a contractor, keeps getting more complex every year as new manufacturers enter the construction industry. The wide variety of attachments that are available requires careful consideration too, he conceded.

Following the selection of equipment, the contractor's next step is moving in on the job, according to Howard. Then he must choose his personnel. He urged attention to such details as the location of drinking water, so that operators will be away from their machines as little as possible, and the location of the maintenance shop. The Cat representative suggested frequent inspection of equipment as preventive maintenance. "Such close attention is worth a nickel a yard on an earthmoving job," Howard declared. In conclusion he disclosed the startling results of a recent survey in which only two out of a group of 115 contractors kept accurate cost records on earthmoving projects. Howard recommended that such cost records be carefully kept as a sound construction business technique.

In the discussion that followed the panel speakers, Arch Williamson of Wm. Bros. Boiler & Mfg. Co. claimed that in building fills the problem was to put the dirt back into its natural state of high compaction. This could be done best, he felt, with pneumatic-tire rollers. Williamson suggested that a research study revealing what happens to dirt under the rolling action of heavy pneumatic tires would be valuable.

Another question that evoked interest concerned the ratio of the value of a contractor's earthmoving equipment to the volume of his work. One contractor cited a 1 to 4 ratio, or \$1 million worth of equipment to handle a \$4 million volume of work. Another said his ratio was considerably higher. According to a survey made by the Bureau of Public Roads, the ratio is about 1 to 2, or 50 cents spent on



RUGGED DESIGN of the American's boom and dipper stick is shown in a close-up at left. Of box-type construction, it has great strength with relatively light weight. The photo also shows clearly how the exclusive dipper pitch bar arrangement makes it possible to tuck the dipper up at an angle to keep the load from spilling. It's another of the advanced, time-saving engineering features that makes American the top-producing Crawler Crane in the field.



LOW OPERATING COST and high production records make the new American 100 Series Crane industry's top dollar buy in the 1/2-yard class. Shown with a shovel front, this versatile, highly-maneuverable crane can be quickly converted for clamshell work, as a lifting crane or backhoe. American's 78 years of experience making the world's biggest and most rugged lifting equipment is clearly evident in this new money-maker. Every pound, every inch of space, is utilized for top production. Everything is easy to get at for routine maintenance.



SAFELY, SWIFTLY, EASILY, a 108-inch concrete pipe section weighing 16,650 pounds is lowered into place by an American 300 Series Truck Crane. The American's power-controlled boom lowering combined safety with speed and enabled the contractors to lower the 8-ton pipe sections with pinpoint accuracy.

RECORDS fall regularly to products of Hoist. Recently, in the Gulf of Mexico, a new Derrick, specially designed for off shore oil operations, made a new world-record lift of 800-tons. The lift was twice the previous estimated record made by the derrick fall method. The same engineering experience is seen in American's extensive line of Crawler Cranes. Day after day, on jobs across the country, American Cranes are proving their superiority in outstanding performance at low operating cost. For details on American Crawler and Truck Cranes, write your local American Distributor, or write American Hoist and Derrick Co., St. Paul 1, Minn.

AMERICAN HOIST

and Derrick Company
Saint Paul 1, Minnesota

For more facts, circle No. 215

equipment for every \$1 in volume of work.

Force account vs. contract

A paper, "A Cost Comparison Study of Force Account and Contract Construction on Five Secondary Projects in North Carolina", was also presented at the Highway Equipment session. Its authors, F. B. Farrell and M. J. Kilpatrick, are both with the U. S. Bureau of Public Roads. Their report presented the results of comprehensive job cost studies made on three contract and two force-account secondary road projects in North Carolina during 1952 and 1953. In their summation, the federal engineers concluded that "exclusive of profit, contract work was performed at a lower construction cost than state force work on the five jobs studied."

New HRB chairman

Kenneth B. Woods, head of the school of civil engineering at Purdue University, Lafayette, Ind., was elected chairman of the executive committee of the Highway Research Board. Prof. Woods, who is also director of the Joint Highway Research Project at Purdue, succeeds G. Donald Kennedy who has served as Board chairman for the past two years. Kennedy is president of the Portland Cement Association in Chicago.

Woods, a native of Washington State, has been at Purdue since 1939, and has occupied his present position there since July 1954. He received engineering degrees from Ohio State University in 1932 and 1937, and was with the Ohio Department of Highways prior to going to Purdue as assistant professor of highway engineering. In 1946 he received the HRB Award for the best technical paper presented, and in 1949 he was given the Board's Distinguished Service Award for outstanding achievement in the highway field. Four years later he was elected to the Board's Executive Committee, and has served as vice chairman of that body for the past two years.

THE END

New York, New Jersey agree to 12-mile toll-road connecting link

A 12-mile link between the New York Thruway and the Garden State Parkway has been agreed to by the states of New York and New Jersey. The feeder road will connect the two superhighways from the Garden State's northern terminus at Paramus and a point north and west of Upper Saddle River Road. A final alignment has not been selected.

Contracts for the work will be let on April 1, with work expected to start on the New York side this summer. When completed, the road will provide direct access from New York to the New Jersey Turnpike interchange at Woodbridge.

A 25 cent toll will be charged on the New Jersey side of the road between Paramus and the state line, but there will be no charge on the New York feeder.



MOUNTED ON A TOWING TRAILER, the hydraulic iron master can go anywhere to bend and shear any size of reinforcing rod. The unit easily handles a 1 1/4-inch No. 11 rod or several smaller bars at one time. Its power comes from an 8.4-hp Briggs & Stratton engine, a Vickers hydraulic pump, and two double-action hydraulic cylinders. For further information write to Midland Products Co., 181 Greenwood Ave., Midland Park, N. J., or use the Reader Card at page 18. Circle No 179.



Heaping load on the bulldozer is easily handled by the Turbocharged D9. Notice all-around visibility from operator's seat—also easy access to controls.

D9 SETS PRODUCTION PACE CROSSING EA ON SECTION 33, MASSACHUSETTSUR

A bid of \$4,719,719 on Section 33, Massachusetts Turnpike, won the contract for J. F. White Contr. Co., Cambridge, and Consolidated Constr. Co., Attleboro, Mass. Among other work, specifications on this 3.89-mile section called for excavating 1,720,000 cu. yd. of earth, 46,100 of rock and 231,800 of peat, as well as handling 507,800 cu. yd. of borrow and 205,000 of gravel.

In the equipment line-up, there was a fleet of Caterpillar units including a D9, four D8s, two No. 90s, one D6, four DW21s, a No. 12, a No. 212, a D337 and two D13000s in draglines. Here you see the Turbocharged CAT* D9 Tractor with No. 9S Bulldozer pushing fill into a peat bog.

On this well-planned operation, seven scrapers hauled the fill to the D9. Making round trips of about 4500 feet, the wheel-type DW21-No. 21 Scrapers averaged 15.4 pay yards a trip. On shorter hauls, the crawler-drawn No. 90s averaged 22 pay yards a trip. During its

10-hour day, the D9 set such a fast pace for the scrapers that only occasionally was it necessary to have another dozer lend a hand with the fill.

For jobs that call for top production, you can't beat the dirt-moving capacity of the giant D9. For complete facts about the new king of the crawlers, see your nearby Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE D9—NEW KING
OF THE CRAWLERS

CONTRACTORS AND ENGINEERS



NEW FEATURES on the 1956 models of the Ryan sod cutters include two-speed transmission, fast depth and blade-angle adjustments, completely sealed gear case, and larger engines on the 18 and 24-inch machines. Other landscaping equipment made by Ryan includes tree movers and lawn edgers. For further information write to **Ryan Landscaping Equipment Co.**, 871 Edgerton St., St. Paul 1, Minn., or use the Request Card at page 18. Circle No. 180.

BIG PRODUCTION FEATURES OF THE D9

First Track-Type Tractor with Turbocharger

The D9's Turbocharger is driven by engine exhaust, utilizing energy which would otherwise be lost. It packs air into the engine according to engine load, not engine speed, for more working horsepower.

Choice of Torque Converter or Direct Drive

To match the tractor to your job, two types of drive are available: the exclusive Caterpillar Oil Clutch with six-speed transmission (both in forward and reverse) or a three-stage torque converter with three gear ranges.

Completely New 286 HP Engine

The powerful D9 Engine features, in addition to the Turbocharger, a 6 1/4" bore and 8" stroke and runs at 1200 RPM.

Constant Power Drive for Rear-Mounted Equipment

Power for cable controls, direct from the engine's rear power take-off, makes operation completely independent of flywheel clutch or torque converter, boosts operating efficiency.

Easy to Operate

Hydraulic boosters provide power for steering and braking and master clutch operation. The 7-roller track frame provides excellent stability, flotation and ride. The starting engine has an electric starting system and simple single-lever control for easy and convenient operation from the seat. Fast, sure starts in any weather.

Easy to Service

Oil clutch, torque converter, transmission and steering clutches can each be removed individually without disturbing other components. Hydraulic track adjusters are among the many other features for fast, easy adjustment.

Portable weigh batcher chargers transit mixers

A folder from The Travel Batcher Co. announces its Travel Batcher, a unit that can transfer preweighed batches of any size from dump trucks to a truck mixer. The unit also allows batching from stockpiles with any front-end loader, and positions the hopper containing the entire batch for instant mixer charging. Pictures show how all three of these operations are done.

To obtain this folder write to The Travel Batcher Co., 6450 Holladay Blvd., Salt Lake City, Utah, or use the Request Card at page 18. Circle No. 90.

Steel Joist Institute

The Steel Joist Institute, an association of structural materials manufacturers, has adopted a program for the control of the quality of standardized products manufactured by its members. Under the program, joists selected at random from production lines are measured for dimensional tolerance, panel spacing, eccentricity of joints and alignment of bearings.

Tests of tension and of compliance with approved design will also be made. Results will guarantee the consumer that the steel joists conform to the institute's specifications.

New text covers surveying

A new book from the Philosophical Library, "Modern Surveying for Civil Engineers", by Harold Frank Birchal, O.B.E., D.F.C., discusses in detail the practice of surveying, estimating and setting out works, and modern photographic and aerial surveying as they are applied to engineering. Refresher material on the preliminaries of surveying is given.

A second, revised edition, the text has been brought up to date by the inclusion of descriptions and illustrations of new equipment and methods. Maps, charts, photographs, and diagrams illustrate the material, and an index makes it simple to locate topics.

The author is the late chief engineer to the Kenya and Uganda Railways.

Priced at \$15, the book is available through the Philosophical Library, 15 E. 40th St., New York, N. Y.

N. J. Turnpike Authority issues annual report

New records in traffic and revenue, an outstanding safety record, and a large volume of construction were features of the 1955 report of the New Jersey Turnpike Authority. A total of 25,888,391 revenue-paying vehicles used the 118-mile turnpike during the year for a total of \$21,122,503 in tolls.

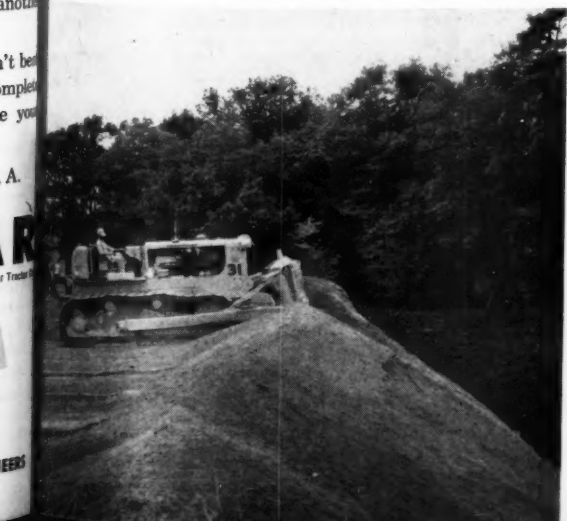
The construction of the Newark Bay-Hudson County extension and of the connection with the Pennsylvania Turnpike have progressed according to schedule. Accident, injury, and fatality rates were well below the average of other New Jersey highways and of the nation as a whole.

For more facts, circle No. 216

NEAT BOG TURNPIKE

Almost singlehanded, the D9 handles all the fill brought up by seven scrapers on Section 33, Massachusetts Turnpike, near Framingham.

Back of the D9, a dragline powered by a Cat D337 Engine scoops peat from bog.



by **CARL D. SMITH, Manager,**
Special Purpose Tire Sales
The General Tire & Rubber Co.,
Akron, Ohio

Save money by lowering operating cost of giant tires

Since the development of the giant tire-equipped tractors and trucks, which have had load, speed, and length of haul constantly increased through greater horsepower, more and more work has been required of tires.

While the tires have been greatly improved throughout the industry during this period, these three increased operating requirements have brought about a heavy increase in tire investment and tire-usage cost. Despite these high tire costs and

the extremely variable operating costs, savings can be achieved through better selection and handling of tire equipment.

To get a clearer picture of the cost of these giant tires in relation to the machines on which they are used,

consider that each tire of the larger sizes is about equal in value to 100 average passenger-car tires. The user's tire investment on one of these big 20 to 25-yard machines is about equal to the cost of tires for 100 passenger cars. Tire investment for 10 machines is equal to that for 1,000 passenger cars.

On a percentage basis, the passenger car carries some 3 per cent of its selling price, or \$90 (3 per cent of \$3,000) in its tires, while many of our big contracting machines selling at \$30,000 are equipped with some \$9,000 in tires—nearly 30 per cent of their selling price. In other words, there is nearly as much rubber in dollars and cents on a \$30,000 road builder as there is on \$300,000 worth of automobiles. One contractor who uses 27.00 x 33 36-ply tires emphasizes their value to employees by telling them that every time one of these tires blows out "it's goodbye to one Cadillac".

The outstanding improvements in our giant earthmoving machines have been due to the increase in engine horsepower, which has made it possible to haul greater loads at faster speeds. But increased horsepower has also thrown more work on the tires.

While engines have gone from 135 to 300 horsepower—a rise of over 120 per cent, tread width and bar length on tires had risen only some 30 per cent before the advent of the wide-base tire brought the figure to about 60 per cent. This is a great improvement, but still leaves a tremendous amount of increased horsepower for each inch of bar length or tread width to handle. Such additional work required of the tires makes for higher operating costs of tires. If the tire equipment is well selected and well managed, these costs can be controlled, and usually at a substantial saving. But if equipment is not thoroughly supervised, these costs have a tendency to grow and cut into profits.

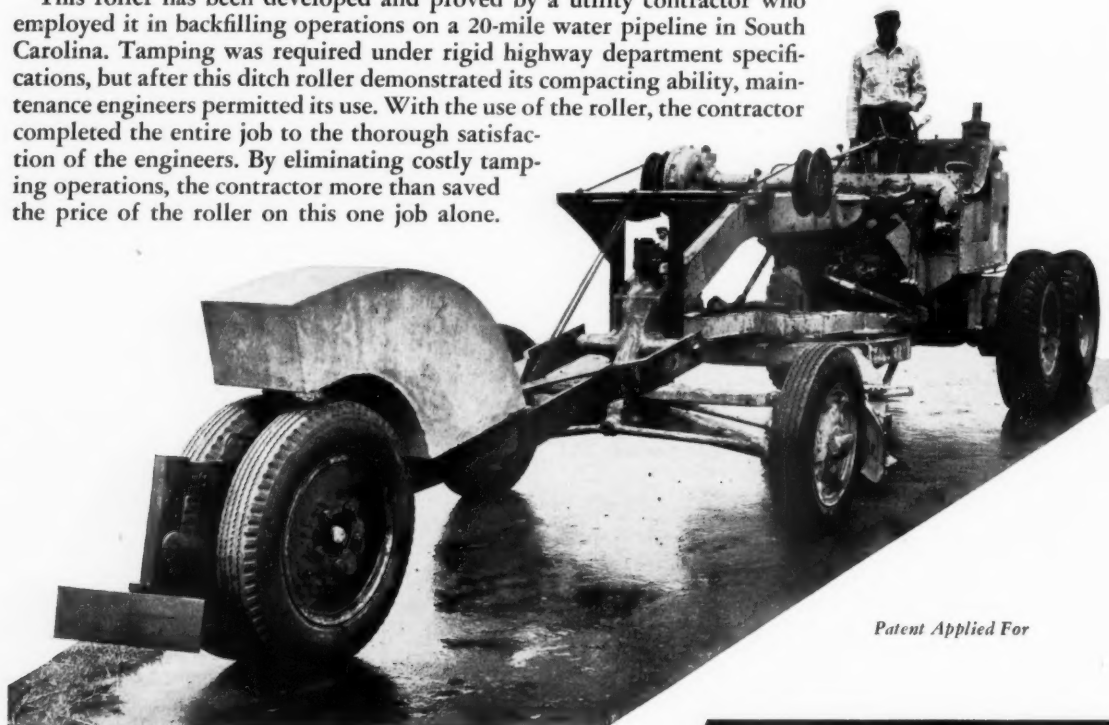
Tire selection

The first means of controlling these tire costs lies in the selection of the proper tire that will most economically do the job at hand. All three general types—the wide-spaced open-bar maximum-traction, the closer-bar rock type, and the button-type earthmover, and the new All Duty work best on definite types of jobs. But to get them and keep them on jobs where they operate best can be a problem.

It would seem that the urgent desire of the machine user for more traction, so that tires are able to

Cook's Pneumatic-Tired Ditch Roller

This roller has been developed and proved by a utility contractor who employed it in backfilling operations on a 20-mile water pipeline in South Carolina. Tamping was required under rigid highway department specifications, but after this ditch roller demonstrated its compacting ability, maintenance engineers permitted its use. With the use of the roller, the contractor completed the entire job to the thorough satisfaction of the engineers. By eliminating costly tamping operations, the contractor more than saved the price of the roller on this one job alone.



Patent Applied For

The roller is shipped from Augusta, Georgia as a complete package for Caterpillar patrols models Nos. 212, 112 and 12.

To attach to a patrol, the section that holds the different sheaves are attached to the front frame of the patrol by drilling and tapping four 5/8-inch holes, using four studs to attach it.

The cable for raising and lowering the roller into the ditch is worked from two drums that are furnished. The drums replace the scarifier arms, with the scarifier being either tied up or removed while the roller is in use.

The leveling blade at the front of the roller is adjustable so that it can be lowered as the ditch is filled. It can be leaned back or forward to keep it level regardless of the depth the roller is in the ditch. This leveling blade can also be turned to either the left or right, according to the side from which the dirt is being backfilled.

Normally, 6-inch layers of back-fill can be rolled with 100% compaction being obtained.

The roller is effective to a depth of 6 feet. It is designed to work behind wheel or ladder type ditchers cutting up to 24-inch-wide trenches.

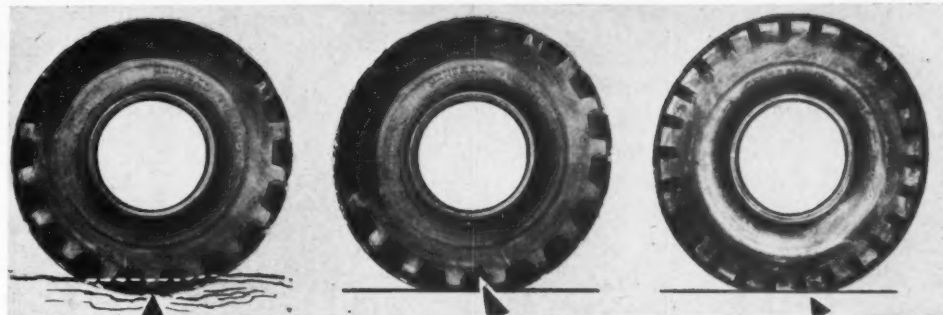
The roller bears 1,650 pounds on the two tires while rolling. The shipping weight of the roller is 2,350 pounds.

Dealers interested in handling this roller will please contact

JOHN R. COOK, P.O. BOX 597, AUGUSTA, GEORGIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 217

This sketch shows tires best suited for hard and soft roads. The traction-type tire, at left, sinks into the earth of a soft road so that the entire body of the tire is supported. On a hard road, center, the body of the tire remains unsupported between the tread bars. The tire body of the rock type, extreme right, is completely supported on the hard road by the close tread bars.



accommodate the higher horsepower per inch of bar length, has been responsible for the use of wide-spaced-bar traction-type tires in jobs where rock-type tires might have been used. The latter type, built so that its bars can sink into the earth, could in this

instance reduce operating expenses.

The rock-type tire, with a larger number of wide bars and a greater amount of wearable rubber, has a much better distribution of load on both the tread and body of the tire. This better load distribution over a

greater volume of wearable rubber contributes to longer tire life and lower operating costs. In my opinion, tire costs can be kept down by the use of rock-type tires in all cases except those where the greatest amount of traction is absolutely essential for

satisfactory operation. This would include operation in sand or soft and loose dirt.

The earthmover or button-type tread tire is fast losing position to the traction and rock types as crawler-drawn scrapers give way to



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**Clipper
JOINT SEALERS**

Take Your Choice...

- **HOT POUR**
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To Meet Job Requirements

CLIPPER HOT POUR JOINT SEALERS



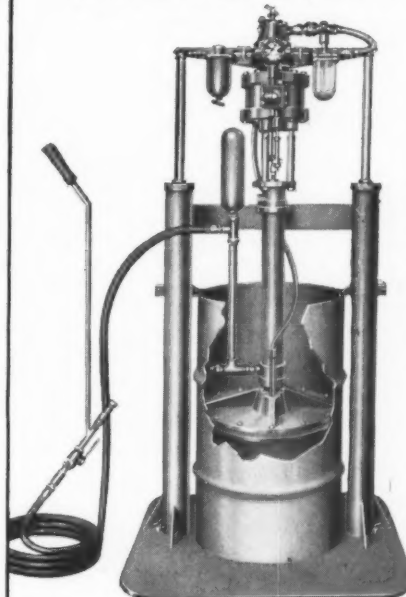
MODEL AC-40

Clipper's Model AC-40 combines the melting and sealing operation in one compact unit and permits one-pass pressure sealing direct from kettle to the joint. Joints are completely filled from the bottom up with any hot poured rubber asphalt joint sealing compounds, including Jet Fuel Resistant.

SEAL UP TO TWO MILES OF JOINTS PER DAY

With the Clipper AC-40 Joint Sealer it is now possible to seal an average of 1250 feet an hour—over 2 miles of joints during a normal working day—faster than any other hot sealing method. All over the world... on turnpikes, airfields and state highways, the Clipper AC-40 Joint Sealer has been in action, introducing a faster... easier... and newer way to seal all contraction and longitudinal joints. Write today for complete information on Clipper's exclusive line of Hot Pour and Cold Applied Joint Sealers for the fastest, most efficient joint sealing you've ever known.

CLIPPER COLD APPLIED JOINT SEALERS



← **MODEL CP-400**

Here's a low-cost complete sealing unit for efficient joint sealing with any cold-applied sealing compound. Air-operated, the CP-400 seals up to 2 miles of joints in a normal working day. Power-prime elevator and flexible drum wiper removes all the material from the drum and assures efficient cold weather operation.

MODEL CP-300 →

Completely portable, the Clipper CP-300 is a high-efficiency unit for all cold applied sealing compounds. Attaches quickly to drum of compound. CP-300 features special pump tube assembly for high volume delivery. Sealing speed equals CP-400 in normal weather. Also can be converted to CP-400 Model when desired.



Clipper

KANSAS CITY, MO.

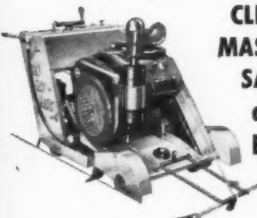
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- ☐ Concrete Saws ☐ Masonry Saws
- ☐ Diamond Blades ☐ Abrasive Blades
- ☐ Send representative to see me

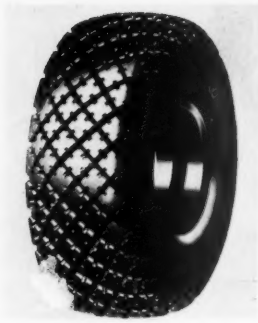
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COMPANY _____

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rubber-tire equipment. But for a few exceptions, it might be more economical for the user to standardize on rock and traction tires, using repaired and recapped tires on slow-moving, free-rolling wheels wherever size permits. Much tire expense can be eliminated by using repaired tires on free-rolling wheels. The All-Duty tire is a new wide-base addition to the General line of off-the-highway tires.

Varying travel conditions may influence the selection of the type of tire best suited to a job. If machines have to travel over different types of ground, a user could probably best profit by selecting the type of tire most suited to the ground on the major portion of the job. If in doubt, he could have two traction and two rock-type tires on each machine, with four like-size tires ready to be changed about as traction requirements indicate. Here it should be mentioned that tire-changing costs are low in relation to the operating costs of tires.

Tire construction

After selecting the type of tire best suited to a job, the user can well afford to consider various makes. These differ in construction and performance. Some have stronger, more stabilized cord bodies, and some have stronger beads. Some have wider treads. Users cannot see the inner body and bead construction, but they can see and examine the treads.

All the engine horsepower must be transmitted through the tread and the load rolled over the roadway. The ability of these treads to perform these functions varies widely in different tires. It takes a lot of power to roll these treads over the road. Some, requiring much less power to roll than others, save the user money that would be taken up by power cost and help the machines to do more work and thus earn more money. Some travel straight. Some worm in travel and require constant steering. Some treads are wider than others.

Tires with wider treads are preferable, because they permit better operation and more economical operation of a machine. The wider the tread, the longer the bars for greater traction, flotation, and braking power. A wider tread makes for more stability and safety in operating the machine. And a wider tread area on the ground means less weight on each square inch of tire, giving it a longer life and more economy in operation.

New purchases

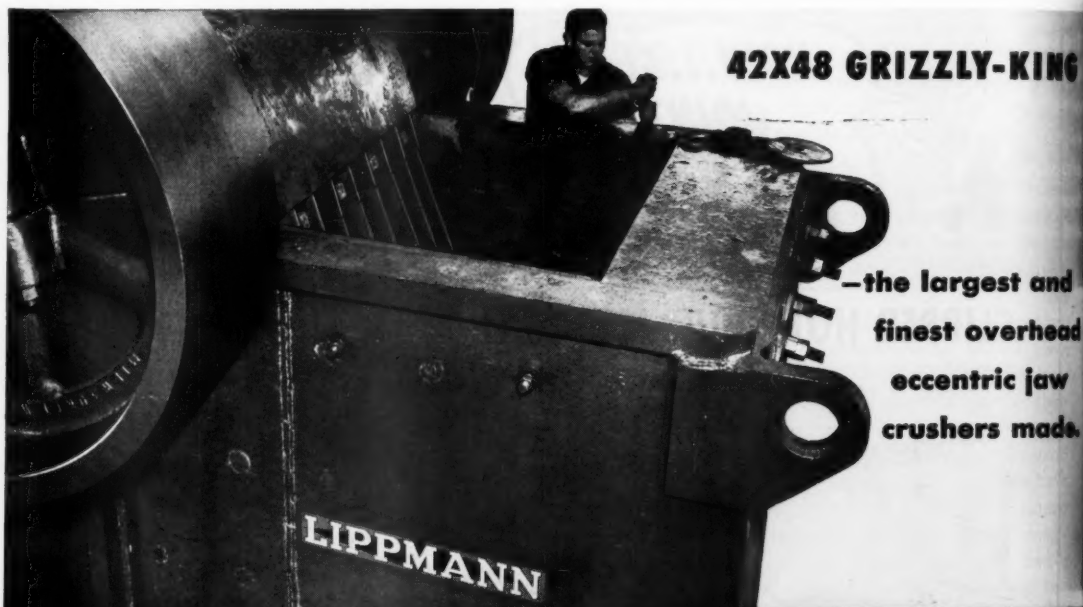
A reduction in tire costs can be effected not only on replacement pur-

These four types of tires are suitable for different work. Left to right are the traction type, which operates best in sand or soft dirt; the rock type, which works well in almost all other cases; the earthmover type, now fast giving way to the former two; and the All-Duty, which combines features of the traction and rock-types.

chases, but when a user buys a new machine. Tire equipment—amounting to a specified amount in a new machine—warrants a careful consideration of future operating tire costs.

In selecting tires for replacement, initial cost is only the initial part of tire operating costs. Bargain tires too often are bargains only in the purchasing department.

Whether a tire has been a bargain or a cost-saver or not is determined by the total cost of its operation by the time it goes to the scrap pile at the end of its useful life. The total cost must include all repair costs and other expenses incurred in its operation. It should include retreading for lowest unit costs. When all the costs are added up, the "bargain" tire too often turns out to have been expen-



42X48 GRIZZLY-KING

—the largest and finest overhead eccentric jaw crushers made.

GRIZZLY-KING superiority

You just can't appreciate the superiority of a Grizzly-King overhead eccentric jaw crusher until you've seen one in action and talked to those who have them.

Owners will tell you about tremendous production capacity, continuous service records, low jaw-die replacement costs, freedom from servicing and adjustment, low power costs.

No wonder Lippmann Grizzly-Kings continue to dominate the giant size (30x42 to 42x48) as well as regular size (12x36 to 24x36) overhead eccentric jaw crusher fields. A Grizzly-King was the world's largest 8 years ago and a Grizzly-King is still the world's largest today — in size (dimension and weight),

1100-56-1

Typical comments from Grizzly-King owners everywhere: —

"Wouldn't have any other crusher but a Lippmann"

"Crushed 1,200,000 tons without turning jaw dies . . . and they're still going strong"

"During the 5 months it has been in ser-

vice, it has required no adjusting or servicing except for lubrication"

"Maintenance? Haven't even replaced a die-bolt"

"Haven't turned my Grizzly-King dies even after 2 1/2 million tons"

vice, it has required no adjusting or servicing except for lubrication"

"Maintenance? Haven't even replaced a die-bolt"

"Haven't turned my Grizzly-King dies even after 2 1/2 million tons"

CONTRACTORS AND ENGINEERS

give when it came to operation.

Other expenses

Two big expenses caused by tire failures are not included under the cost of tire service. One is the cost of downtime due to tire failure. This expense runs so high on big machines that it is questionable if some tires can be accepted at any price in preference to others.

The second cost arises from the bad effect of haul roads on tires. Good roads cut tire usage costs, and though it may be a bit farfetched, the maintenance of good roads for better tire service is a part of operating costs.

Knowledge of tire costs is becoming more and more essential to the user. The only known method of keeping track of such costs is to have a card

record of each tire. A year's record kept by one larger user of 16.00 x 25 24-ply rock-type tires revealed that one tire cost \$0.224 per tire hour of operation, a second cost \$0.262, and a third cost \$0.275. The average of all makes came to \$0.259. The few cents difference per tire hour amounts to a sizable annual sum, as the accompanying table shows.

Tire life

Many factors affect the life of tires operated off highways. Among the most important is amount of load, speed, length of haul; the condition of the roadway; and the amount of air pressure in the tires. All these factors are so intertwined that it is next to impossible to consider one without considering the others. Here, however,

each can be considered as part of the over-all operation.

Overloading tires has never proved a good method of cutting costs of tire operation. In fact, if complete records on the total cost of operating heavy

16.00-24/25 24-Ply Nylon Rock Type Cost per tire-hour of service		
Tire A nylon rock type		\$.224
Tire B nylon rock type		.262
Tire C nylon rock type		.275
Average all-nylon tires		.259

Savings Tire A 3½ cents over average and 5.1 cents over Tire C

Savings per hour per tire	\$.03½	\$.051
Savings per hour 10-tire truck	.35	.51
Savings 1 truck 10-hour day	3.50	5.10
Savings 1 truck year—200 days	700.00	1,020.00
Savings 50 trucks year—200 days	35,000.00	51,000.00
Savings 100 trucks year—200 days	\$70,000.00	\$102,000.00

hauling machinery were kept, it might show up as an expensive practice. I know of no recent complete records showing operating costs-cutting by controlling the load and keeping it within the limits of the tire's and the machine's rated capacity.

During the construction of one large dam for the federal government, the practice of load control increased total output with a fixed number of hauling units by 10 per cent and cut tire and mechanical repair costs by 50 per cent. It would be interesting to know what might be accomplished by load control in cases where all hauling units are loaded to capacity as well as guarded against overloading. It would be interesting to know the cost of downtime from mechanical failures due to overload.

We are living in an age of speed, and it seems out of order to mention limiting speed. But overload with excessive speed produces large impacts on tires, and this makes for a short tire life and high tire operating costs. Doubling the speed increases the impact four times, even if the increase from overload is not considered.

Type of road

To get good tire service with machines working with heavy loads and at high speeds, the roadway must be kept free of all objects that would give a tire a hard bump. Where the road is extremely rough, soft, or sandy, and speed is necessarily restricted, air pressure in the tires can be lowered to lessen the danger of hard impacts and thus increase the life of a tire. If machines using big tires are working, a road patrol is essential to keep tire costs down.

The amount of air pressure used in tires is the key to tire life on all off-highway operations. When machines use highways, air pressure in tires is more or less fixed for travel on these uniform surfaces. But to get optimum tire operating costs off the highways, air pressure should be kept as low as possible while accommodating the load and speed of a rig. Air pressure should never be higher than Tire and Rim Association recommendations.

Lower air pressures in tires operating off highways brings tire operating costs down, lowers tire rolling resistance, and increases traction. General operating costs, as well as tire operating costs, can be cut by lowering air pressure in tires when it is not necessary or possible to operate the machine at higher speeds.

A few other things are worth remembering in attempting to avoid expensive tire bills. The bigger the

These 42x48 GRIZZLY-KING crushers, the biggest overhead eccentric jaw crushers ever built, are already established as performance kings in output and low-cost operation.



Davidson, N. C.



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South Zanesville, Ohio

breaking rocks and records ...all over the world

These older installations of GRIZZLY-KING giants have been establishing themselves right along as production leaders in some of the biggest quarries.



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pusher used, the more the traction tires will be relieved of slipping and spinning. This action causes fast and costly wear and excessive cutting. And when rubber-tire tractors are used to open up an area, clearing the roadway of stones and stumps will result in less damage to tires.

In bringing tire operating costs down, all the routine work—like making sure tires have sufficient air pressure and having cuts repaired immediately—are just as essential as ever.

THE END

Testing instruments

■ Literature is available on the Carver laboratory press for testing soil, concrete, the crushing characteristics of aggregates, and other construction

materials. Pictures of each piece of equipment for these tests are shown, along with specifications and general directions for performing the tests.

To obtain this literature write to Fred S. Carver, Inc., One Chatham Road, Summit, N. J., or use the Request Card at page 18. Circle No. 69.

Fuel-injection pump

■ The Roosa Master Model D, a diesel-engine fuel pump, is featured in a catalog from the manufacturer, Hartford Machine Screw Co. The pump's fuel-distribution principle, maximum fuel adjustment, drive shaft, and governor linkage are discussed.

To obtain this catalog write to Hartford Machine Screw Co., 92

Deerfield Road, Hartford 2, Conn., or use the Request Card at page 18. Circle No. 54.

Work on gas line starts

Construction of a natural gas line for the Westcoast Transmission Co., Ltd., is now underway, with Canadian Bechtel Ltd., Vancouver, B. C., Canada, as project manager.

The main line, starting in the natural gas fields of Alberta, B. C., will be 650 miles long.

Pipe-driving tools fit paving breakers

■ Accessory tools to be used with standard pneumatic paving breaker-hammers has been introduced to the

market by Delaware Tool Steel Corp. The PipedrivR tools, made of a heat treated alloy, are adaptable for driving pipe up to 2 inches, or for replacing old pipe with new.

It is claimed that the design protects mill wrap from stripping in the



driving operation. Pipe drivers with adapters, connecting pins, and driving points are available individually, or as a complete set in a kit.

For further information write to Delaware Tool Steel Corp., Wilmington 99, Delaware, or use the Request Card at page 18. Circle No. 109.

Forming catalog

■ The Symons forming system is presented in a catalog describing a variety of form components. Steel frame, magnesium, and wood forms in various dimensions are shown. Form hardware, column clamps and shores, plus job applications are pictured along with specifications.

To obtain this catalog write to Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 95.

New booklet discusses federal aid to highways

An illustrated 24-page booklet on federal aid to highways has been released by the National Highway Users Conference. The material includes a description of the various federal-aid highway systems, explains how federal-aid money gets to the states, and discusses how federal aid to highways works.

A chapter on the development of the U. S. Bureau of Public Roads is also included. Maps, charts, and drawings illustrate the text.

A copy of this booklet may be obtained from the National Highway Users Conference, 966 National Press Bldg., Washington 4, D. C.

Storm clothing

■ Protective and safety clothing against abrasion, oils, greases, chemicals, and weather are presented in a catalog from H. M. Sawyer & Son Co. Included in this line of clothing are industrial suits, coats, raincoats, coveralls, hats, and hoods made of neoprene latex or rubber. Complete sizes and descriptions are given.

To obtain this catalog write to H. M. Sawyer & Son Co., 20 Thorndike St., Cambridge 41, Mass., or use the Request Card at page 18. Circle No. 52.

New POWER

... TIME-PROVED JOHN DEERE ECONOMY



Everywhere . . . on all types of work . . . John Deere "40" Series Crawler and Wheel-Type Tractors have been making good with contractors, municipalities, and industrial users.

Now, the new "420" Series Tractors, with 20 per cent more power, offer you even better performance, even lower costs per job.

Here is the compact, rugged construction, the dependable day-in-and-day-out performance that enables you to get more work done in a given period.

Here is the all-around economy—fuel economy . . . oil economy . . . maintenance economy that sets new high standards—economy that means real dollars-and-cents savings, more profit each year of the tractor's long life.

Top: HANDYMAN "420" CRAWLER . . . 25 drawbar h.p. . . 4- and 5-roller sizes . . . little giant in work capacity. Shown with backhoe, one of its many matching tools.

Above: HANDYMAN "420" UTILITY . . . the low-built, highly maneuverable wheel-type tractor for all-around work. Three-point hitch regular. Shown with front-end dozer.

Here is wide, all-around adaptability to jobs of all kinds, with a great matching line of John Deere and allied working equipment.

There is a John Deere dealer near you. Ask to see the new John Deere "420" Tractors.

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Industrial TRACTORS and Equipment

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The airborne crane developed by the U. S. Army Corps of Engineers lifts a 16,000-pound tractor. The crane, which can be dropped in forward areas, weighs 14,700 pounds.

Army engineers develop new airborne crane

An airborne crane capable of lifting more than its own weight has been developed by the U. S. Army Corps of Engineers at the Research and Development Laboratories, Fort Belvoir, Va. Considered airborne because it can be transported as a unit and is capable of operating within an hour after delivery, the crane is expected to be air-droppable as well.

The unit, which weighs 14,700 pounds, is designed to lift 9 tons at a 10-foot radius with outriggers. Without outriggers, it has a capacity of 7 tons at the same radius. A 40-hp gasoline engine powers the unit. Measuring 22 feet 6 inches long, 8 feet 2 inches wide, and 6 feet 9 inches high, the crane is within the critical transport limitations of cargo aircraft.

The machine is equipped with shovel, dragline, and clamshell earth-moving attachments of ½-cubic-yard size.

The Wayne Shovel & Crane Division of American Steel Dredge Co., Fort Wayne, Ind., now American Steel Dredge Division of American Hoist & Derrick Co., worked with the army in developing the crane.

Hydraulic pumps, valves

Electrically controlled hydraulic pumps and cylinders operating on 100 to 5,000-psi pressures are shown in a catalog from the Donnell Hydraulic Co. These hydraulic units, designed for mounting on trucks, tractors, or other equipment, operate on a 6 or 12-volt electric-starting motor.

Also shown are hand pumps offered in three pressure sizes that will handle pressures up to 5,000 psi. High and low-pressure rams with diameters up to 4½ inches for power or hand pumps are shown. Seven power valves are pictured and briefly described.

To obtain this catalog write to Donnell Hydraulic Co., 100 W. Prairie, Marengo, Ill., or use the Request Card at page 18. Circle No. 44.

Waterproof clothing

Life Guard rain suits and accessories for outdoor service crews are presented in a catalog from John E. Dorsey Co. Nylon-neoprene jackets with detachable hoods, overalls, pants, and coats in various sizes are shown. Rubber boots in different styles and sizes are included.

To obtain Catalog No. D. 3 write to John E. Dorsey Co., 80 K St., Boston 27, Mass., or use the Request Card at page 18. Circle No. 53.

Line of steam cleaners

Malsbary's eight basic models of steam vapor cleaners with outputs up to 2,100 gph at 400 psi are announced in a catalog. Pictures and a

brief description accompany each model. A chart lists pressures, temperatures, and capacities of the various models.

To obtain Catalog 156 write to Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 66.

Hewitt-Robins appoints

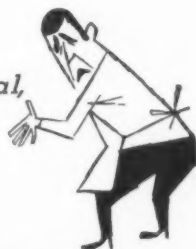
Martin Vander Laan has been appointed manager of operations of the engineering division of Hewitt-Robins, Inc., Stamford, Conn. He has been with the company since 1934, serving in both the United States and abroad.

The engineering division, located in New York, N. Y., specializes in the design, engineering, and erection of conveyor systems for ore, coal, etc.

Why buy a truck in the dark?

"Oh, kick me!" cries Merchant Neal,
In a posture hardly genteel.

He bought trucks in haste,
Then the costly fact faced,
That he'd missed the Dodge Dealer's Deal!



If you buy a new truck after looking at only one make, it's like making a deal in the dark. A smarter way to buy is to "spotlight" real truck value—weigh and compare competitive claims with these Dodge truck facts:

Most standard V-8 horsepower of all leading makes—½-ton through 3½-ton range. You'll make faster trips—get more work done!

Shortest turning radius. You'll maneuver in traffic, and park more easily.

Biggest cabs, with biggest wrap-around windshield. You'll enjoy more comfort, safer vision.

Highest payload capacities . . . pick-ups providing up to 22% more payload than others.

Prices down with the lowest.

Next truck you buy, don't deal in the dark. Turn a bright light on the facts. See Dodge before you buy.



GET THE DODGE
DEALER'S DEAL
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DODGE

Job-Rated

TRUCKS

WITH THE FORWARD LOOK



For more facts, use Reader-Reply Card opposite page 18 and circle No. 221

Standardized beam guardrail may end one maintenance problem

*Proposal by New Jersey wins wide acceptance
in other states; cooperation of manufacturers
spurs move toward high-type beam*



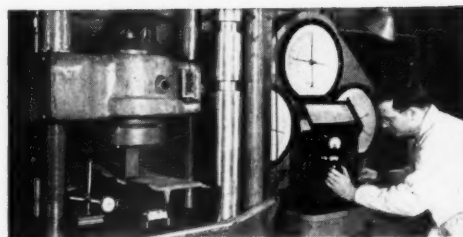
Biggest reason for using only Caterpillar original parts in your machine is a reason you cannot see or feel. It is the *ancestry* of Caterpillar parts.

Behind each and every CAT* replacement part is the experienced engineering, painstaking research, grueling testing, skilled manufacturing and rigid inspecting which make Caterpillar products the standard of the industry. With these truly "pedigreed" parts you can be sure of better all-around performance, less down time.

With substitute parts, can you be sure of anything?

See your dealer's Parts Representative — get Caterpillar original parts every time.

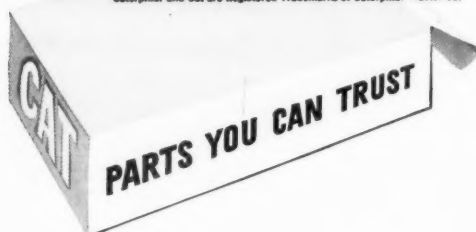
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



Special gauge measures exact amount of strain a track shoe part can endure. Constant testing like this guarantees that all parts are made to the highest Caterpillar standards. Why be satisfied with anything less?

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 222

State highway-maintenance departments may soon find one of their biggest problems non-existent.

The problem may be solved by a new beam guardrail, designed to meet the specifications set up by the New Jersey State Highway Department, in collaboration with other state highway departments. It uses a splice bolt assembly that minimizes the work of fitting sections together. The rail has been under test for the past two months. The significance of the guardrail lies not in these tests for practical standards of strength, but in the fact that the guardrail may become standard on U. S. highways.

This move toward standardization started when highway department engineers in New Jersey were reviewing maintenance problems involved in stocking and locating many of the different types of beam rail, and the additional types which the department had been requested to approve. During the review, department engineers fix on a single type of guard beam to be used, even though this might involve designing a new one.

Engineers starting this job ran into difficulty immediately. Many different types of beams are available, all of them having similar characteristics, but none of them interchangeable. To accept some of the present types and exclude others did not seem proper to the engineers; yet to accept all products that met strength requirements and other qualifications would have created a maintenance problem, since stocks of many types would have to be kept up in a number of areas.

The department cautiously went ahead with its plans to standardize on a beam guardrail, realizing that one state alone could not support the cost of industry changeover to meet a new set of specifications. Then too, there was the possibility that a standardized guard beam might cause industrial production problems that could not be foreseen.

Manufacturers discuss problem

To meet this problem head-on, the department invited manufacturers interested in supplying New Jersey with beam guardrails to attend a discussion of standardization. This meeting made it apparent that industry itself realized that standardization was inevitable; but the manufacturers reserved agreement to adopt a new type.

Just after this meeting, the New Jersey highway department contacted departments in states along the Atlantic Seaboard and in the Midwest to determine their willingness to consider the problem of standardization. The response from the seaboard states—plus Virginia, West Virginia, Pennsylvania, Ohio, Michigan, and Illinois—indicated that all had maintenance problems similar to those of New Jersey.

Plans for standardization started to jell when New Jersey highway officials and representatives of West Virginia, Maryland, New York, Massachusetts, and Ohio met in Trenton, N. J., and unanimously approved a plan for a

CONTRACTORS AND ENGINEERS

beam sufficiently different from any on the market that no manufacturer could avoid the cost of retooling. This, of course, closed the door on all charges that one manufacturer was being favored over others.

Widespread approval

Unanimous approval of the plan was subject to review at home-state level, and while this was being obtained by the various departments, industry went to work on another phase of the standardization plan. Representatives were sent out to canvass states as to the desirability of adopting one type of guardrail, while manufacturers turned their attention to the job of actually producing the beam guard.

Meanwhile, the proposed plan that had been approved at Trenton and the specifications for the new beam guardrail were submitted for comment to all 48 states, the District of Columbia, Hawaii, and Puerto Rico. These specifications were admittedly high in order to encourage comment on the part of other states.

To date, the New Jersey State Highway Department has received enough response to indicate that the idea has general endorsement. On the other side, industry serving the east and midwest has shown a willingness to make the changeover. Once they were convinced of the feasibility of standardization, manufacturers co-operated in every way in perfecting the beam form, as proposed, and made special efforts to enlist the aid of the bolt industry to provide a splice bolt assembly to minimize the work of assembling the guard beam.

Although the principal rail erector in New Jersey offered some minor suggestions to the department after he had reviewed the plan, he stated that the new rail could be put up without most of the difficulties found in erecting the beam rails now in use.

Right now the department is waiting for test results before determining if the proposed specifications have to be revised so that a beam of practical standards of strength can be produced without any special processing of the metal. But industry is not waiting any longer. Some manufacturers are already going ahead with plans for a standardized beam guardrail, even though all the states have not as yet accepted the proposal.

THE END

Improvements are made on clamshell buckets

Several improvements have been made on the $\frac{5}{8}$ and $\frac{3}{4}$ -yard HiPower clamshell buckets, according to the manufacturer, George Halss Mfg. Co., Inc. The buckets now feature over-size diameter centershafts, extra-heavy double-ribbed blade arms, sturdy reinforcements welded to the side and back plate, and heavy-duty connecting arms. All buckets are drilled for side cutter attachments.

For further information write to George Halss Mfg. Co., Inc., 350 Fifth Ave., New York 1, N. Y., or use the Request Card at page 18, Circle No. 31.

Heavy-duty truck trailers

Hughes low-bed trailers are pictured in a folder. Seven available models range from 10 to 75 tons with straight, single-drop, or double-drop decks. A tandem axle designed for these low-bed trailers has longitudinal and crosswise full oscillation. The axle has an 8-inch brake.

To obtain this folder write to Hughes Trailers, 1029 Brooke Blvd., Kenhorst, Reading, Pa., or use the Request Card at page 18, Circle No. 88.

Sectional hoist towers

Trouble Saver sectional hoist towers of various heights are shown in a bulletin from The Patent Scaffolding Co. Descriptive material in-

cludes on-the-job photos, pictures of prefitted frames and other component parts, and parts numbers and weights.

To obtain Bulletin HT-5 write to The Patent Scaffolding Co., 38-21 12th St., Long Island City 1, N. Y., or use the Request Card at page 18, Circle No. 48.

I-H appoints Colacuori to sales-supervisor post

Filling the newly created position of sales supervisor, motor-truck product development, for the International Harvester Co., Chicago, Ill., is Sal Colacuori. He will work with advanced engineering, market research, and sales engineering groups in the development of new-product design. He will also correlate sugges-

tions for the improvement of I-H trucks.

Fastening system

The Ramset fastening system for concrete, steel, or both, is fully described in a catalog from the manufacturer. The system includes three basic units—tool, power charge, and fastener. Three models for light, medium, and heavy-duty work set $\frac{1}{4}$ to $\frac{1}{2}$ -inch fasteners. A complete line of accessories for each model is shown.

To obtain this catalog write to Ramset Fastening System, Winchester-Western Division of Olin Mathieson Chemical Corp., 12117 Berea Road, Cleveland 11, Ohio, or use the Request Card at page 18, Circle No. 3.



"Ford Power saves us money on the tough jobs"

We've never owned an engine with Ford's ability to dig in and hang on in tough going. On our present job we're breezing right through 18 inches of frozen ground, and doing so with no noticeable increase in operating costs."

—MR. ORVILLE SNEDEGAR
Newcastle Excavating Co.
Newcastle, Indiana



Mr. Snedegar operates a model 510 Unit Challenger, manufactured by the Unit Crane and Shovel Corp., Milwaukee, Wisconsin. Powered by a Ford "172" Heavy Duty Industrial Engine, the Challenger—as a clamshell, hoe or dragline—makes short work of any excavation job.

Ford Power is at work on all types of construction projects everywhere, and with good reason. For who else but Ford offers the industry a full line of modern overhead-valve 4-, 6- and 8-cylinder gasoline engines? And who else but Ford offers Short Stroke design and rigid deep-block construction in every engine?

Short Stroke design cuts friction, reduces engine wear and releases more usable power... power that goes to waste in ordinary engines. Deep-block con-

struction combines with a host of other exclusive engineering advancements to make Ford Industrial Engines the heavy-duty endurance champs they are.

Little wonder, more and more every day, profit-minded operators are swinging to reliable, low-cost Ford Power. Why not you?

And remember... to better serve users of industrial power, a network of newly-appointed Ford Industrial Products Dealers has been set up across the nation. Now there is a Ford Industrial Power Headquarters in your area.



Write or phone today for complete information: INDUSTRIAL ENGINE DEPARTMENT

FORD Division of FORD MOTOR COMPANY P.O. BOX 598, DEARBORN, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 223

Six-speed

automatic transmission

leads 1956 truck line advances

■ An exclusive six-speed automatic transmission heads the list of developments introduced on Chevrolet's 1956 Task Force truck fleet. The new line of 65 models is available on 15 different wheelbases.

The new Powermatic six-speed automatic transmission unit is offered on 15 models in the two-ton group. A new optional heavy-duty five-speed manual-shift transmission is available on a total of 17 two-ton models.

Other advances include a more powerful series of nine V8 and six-cylinder engines in the 1956 line, four V8's and five sixes. Safety advances, including new sealed-beam headlights, an optional governor for the high-powered V8 truck engine model, and a hydraulic retarder which is part of the Powermatic mechanism and augments the regular braking system are also new.

Tubeless tires are now available as standard equipment on all models. With the tubeless tires, Chevrolet introduces a whole new wheel mounting that is lighter, more durable, and easier to service—especially in the case of duals. Tubeless tire advantages are less weight, greater blowout and puncture protection, cooler running temperatures, and easier changing.

Interiors redesigned for better appearance and driver comfort and an exterior that further emphasizes the "load pulling" look of the 1955 models also distinguish the new line.

Effective at all driving ranges, the Powermatic transmission automatically determines a shift schedule according to load, speed, grade and other factors. While it automatically performs these functions over the roughest on-or-off-highway terrain, the unit may also be shifted by the driver into three specialized ranges. These are drive; intermediate, for mountainous country; and low, for controlled power.

The newly developed Powermatic transmission embodies a torque converter in series with a six-speed hydraulically controlled, automatic gearbox. Starting in drive range from a standstill, its torque is as much as 7.5 that of the engine. In low range, torque is as much as 14.8 times that of the engine. The high torque multiplication of the Powermatic converter for starting and six closely stepped ratios provide the most efficient use of engine power for any truck requirement—from the low 14.8-to-1 to 1-to-1. For best fuel economy, the converter is locked out when the vehicle is under way.

Because of a built-in safety device, a hydraulic retarder augmenting the brake system, the Powermatic offers truck drivers greater control than ever before over heavily loaded vehicles. Augmenting engine braking

up to six times the braking force of the engine alone, the retarder gives the truck driver greater downhill control with little, or no use of the braking system.

For further information write to Chevrolet Motor Division, General Motors Corporation, General Motors Building, Detroit 2, Mich., or use the Request Card at page 18. Circle No. 77.

Air-cooled engine

■ The new Lycoming C2-90 air-cooled engine for the construction industry is highlighted in a folder available from the manufacturer. This valve-in-head, two-cylinder engine delivers 30 horsepower. It is reported that 1,000 hours of continuous duty may be had without overhauling. Diagrams and specifications are given.

To obtain this folder write to Lycoming Division, Avco Mfg. Co., Stratford, Conn., or use the Request Card at page 18. Circle No. 13.

Pump maintenance hints

■ New literature offers helpful hints on the maintenance of Morris dredge

pumps. Choosing a dredge pump that best fits a particular need is also discussed.

Twenty-four models in the GA and GAF line, ranging in size from 6 to 20 inches, are outlined.

To obtain Bulletin No. 184-A write to Morris Machine Works, Baldwinville, N. Y., or use the Request Card at page 18. Circle No. 116.

Line of wire-rope fittings

■ A complete line of wire-rope and chain fittings is shown in a catalog from The Thomas Laughlin Division of American Hoist & Derrick Co. Detailed information on dimensions and safe loads for links, rings, shackles, swivels, hooks, turnbuckles, thimbles,

NEW Black & Decker HEAVY-DUTY POWER

Only
\$64⁵⁰

MORE SAW FOR YOUR MONEY —AND WE CAN PROVE IT!

1 Extra capacity! Comes with 6½" combination rip-crosscut blade. B & D KRO-BIDE blades available for every possible job requirement!

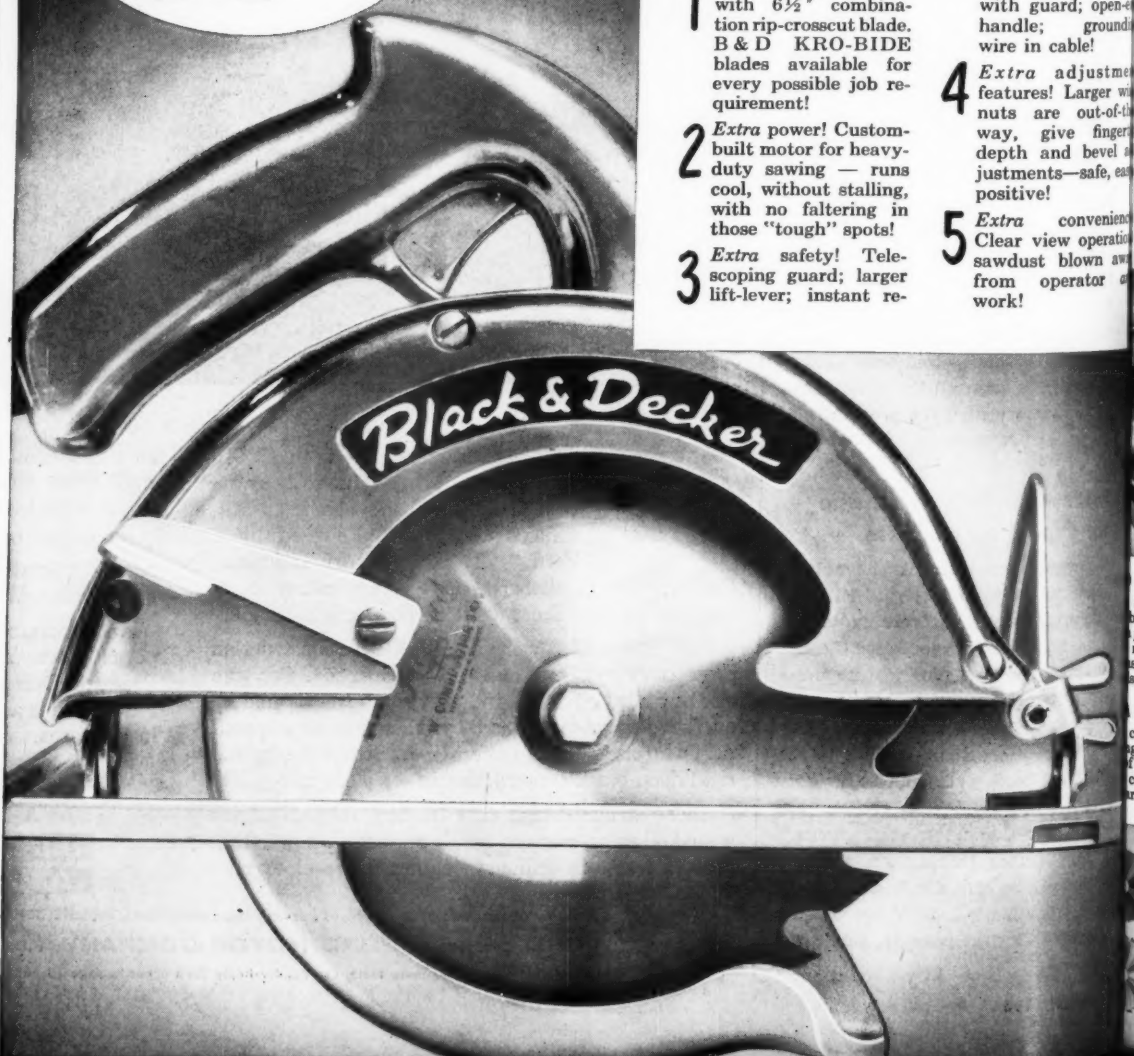
2 Extra power! Custom-built motor for heavy-duty sawing — runs cool, without stalling, with no faltering in those "tough" spots!

3 Extra safety! Telescoping guard; larger lift-lever; instant re-

lease trigger switch with guard; open-end handle; grounded wire in cable!

4 Extra adjustment features! Larger wing nuts are out-of-the-way, give finger depth and bevel adjustments—safe, easy, positive!

5 Extra convenience! Clear view operation; sawdust blown away from operator's work!



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Black & Decker® 6½" SAW PRICED LOW!

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clips, sockets, ring bolts, eyes, and load binders are included.

To obtain Catalog No. 950-1 write to The Thomas Laughlin Division, 100 Fore St., Portland 6, Maine, or American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn., or use the Request Card at page 18. Circle No. 72.

Blade for maintainers

■ A new booklet tells how to maintain gravel roads with a new Shunk blade. Available for any type of road maintainer, motor grader, or terracer, the blade removes ruts and holes, leaving a cushion of loose material at least 1½ inches deep over the entire road surface. This tends to compact

smoothly under normal traffic.

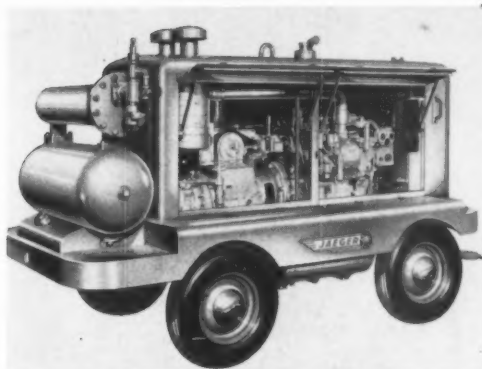
To obtain this booklet write to the Shunk Mfg. Co., Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 165.

Tractor-shovel

■ The outstanding features of the Allis-Chalmers HD-11G tractor-shovel are the subject of a catalog from that firm. Weighing 32,000 pounds, this tractor shovel has a dump height of 11 feet 7 inches. Capacity is 2¼ yards. Net horsepower is 105.

To obtain Catalog MS-460 write to Allis-Chalmers Mfg. Co., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 8.

Jaeger's new 365-cfm Roto Air Plus compressor features a relatively slow operating speed.



New 365-cfm rotary air compressor

■ Conforming to the "new standard" series of air compressor sizes which Jaeger adopted in 1948, Jaeger's new Roto Air Plus unit delivers 365 cfm of air instead of the conventional 315 cfm. This larger capacity is useful for gunite work and heavy-duty sand blasting, or for operating a wagon drill and a hand-held rock drill simultaneously.

An outstanding feature of this and other Jaeger rotaries is the unusually slow speed of operation. Instead of the usual 1,800 rpm, full-load speed in this model is 1,700 rpm, with resultant fuel savings and lengthened engine and compressor life. At this speed the rotary's Model 4-71 GM diesel engine operates with ample reserve power.

Instant-acting controls, with continuous, stepless regulation of engine speed to air demands combine to maintain 100-psi minimum air pressure under all normal working conditions. Over-run and engine-racing are prevented. Two-stage compression and a tube-finned multi-pass oil cooler is said to result in air temperatures at the manifold 100 degrees cooler than in the most efficient reciprocating-type compressor.

An eight-hour fuel tank, adjustable radiator shutter, wrap-around bumpers, and automotive-type steering front axle are standard.

For further information write to Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio, or use the Request Card at page 18. Circle No. 181.

Races through a 2x4, even at 45° angle, with blade to spare—lots of blade for repeated sharpening!

B&D power-built motor gives extra "bite"...for toughest jobs!

A rugged, power-balanced addition to the famous B&D saw line! Remember, we don't buy motors, we build them! Each Black & Decker motor is specially built for the job it must do—and the motor in this new 6½" heavy-duty saw is custom-built to give you more stamina, more sawing "guts" than you'll need! Priced so low that no real pro should ever be without it!

Performs on the job like famous B&D 7", 8", 9" H. D. models!

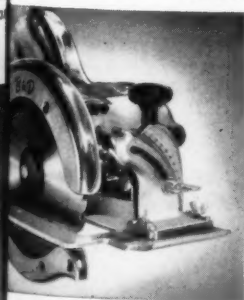
Extra capacity—makes all cuts in 2 x 10 and smaller lumber; cuts 2¼" depth at 90°... cuts 1¾" at 45°... handles practically any building material: hardwoods, Transite, ceramics, tile, etc. Unsurpassed for depth and bevel cutting—quadrant calibrated for precision adjustment; larger wing nuts; larger steel shoe and cutting guide permits safe sawing from either side!

Address: THE BLACK & DECKER MFG. CO., Dept. 7903, Towson 4, Md.

Power-built to take rough usage. Runs cool, even when cutting intricate patterns in 2x4 stock, practically any building material. Full 1" stroke. Armature and gear

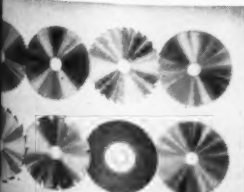
shafts mounted on ball bearings. Minimum vibration, extra smooth performance. Cuts to 45° angle... either side. Lowest price in the field.

Only \$120.00



Heavy-Duty Saw for every job!
Black & Decker offers the most complete line of power-built saw line in the world—power-built tool for every professional need! Ask your dealer about the 7", 8" and 9" Heavy-Duty saws, too!

Saw Blade for every job!
Crosscut, combination, planer, and more blades—you'll find a full selection of B&D KRO-BIDE blades (for cutting job and longer blade life) at your dealer!



Exclusive! Fully adjustable shoe for cuts 0° to 45°—cuts up to 1¾" at 45° on either side of shoe! Full line of wood and metal cutting blades available!

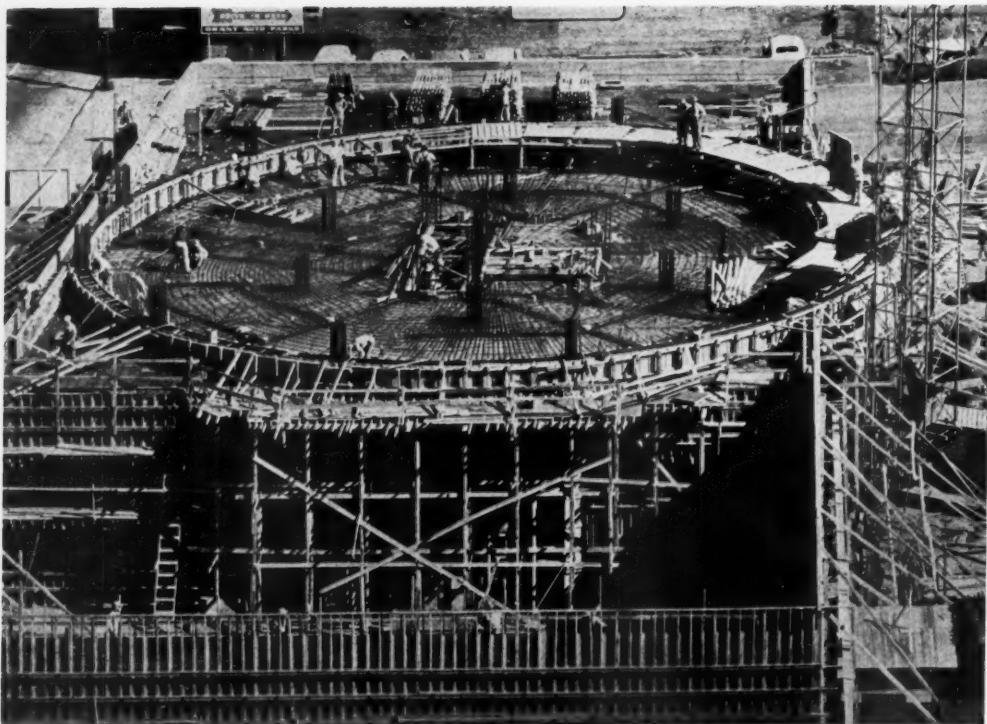
Folder on ditchers, loaders, and conveyors

■ A mailing piece from Barber-Greene shows the firm's variety of models of ditchers, stockpile loaders, and portable conveyor units. A brief description accompanies action shots of each item.

Trenchers include the wheel-mounted Model 705-B Runabout and the crawler-mounted Model 44-C. Stockpile loaders include a wheel model and two on crawler mountings. Also shown is the light, maneuverable Model 550 windrow loader.

To obtain Form 3547 write to Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 50.

←For more facts, circle No. 224



Steel reinforcing for the first circular floor in the tower is set in a radial pattern, while curved bars up to No. 6 in size form concentric circles on the floor. Reinforcing is particularly heavy in the inner and outer rows of columns.

(Additional photo on front cover)

Old and new methods are combined on modern circular building

*Economy influences structure design
and construction; wood shores and hand
buggies are used in pouring floor disks*

by RAY DAY

Disk-like floors that appear to float—particularly under night illumination—and underground reverberation chambers for high-fidelity recording are some of the features that have attracted the attention of architects, engineers, and construction men from all over the world to the Capitol Tower.

Opened last month in Hollywood, the new home of Capitol Records, Inc., consists of a 13-story circular-shaped reinforced-concrete section,

BLUEJET CHAIN

**PRECISION-BUILT
FOR PEAK
PERFORMANCE**

GUIDE LINK—Beamed rivet holes give precision fit, eliminate stretch and "chain slop" for less wear, longer service.

ROUTER—Precision ground, chrome plated high grade steel means longer life, less sharpening.

SIDE LINK—Shaped for proper sprocket fit, ample "riding" area reduces bar wear, gives smoother cutting.

RIVET—Large head plus hardened bearing surface helps maintain chain tightness, assures longer life.

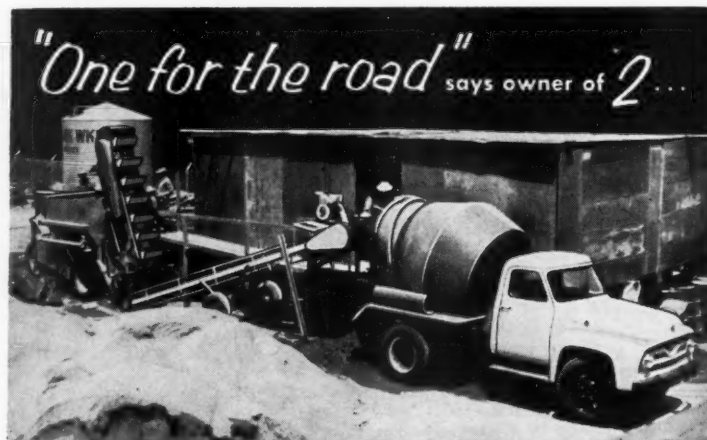
BlueJet Chains, bars and sprockets are manufactured under a system of rigid quality control. They are job-engineered and field-tested to give superior results and longer wear—with all makes of chain saws, in all types of cutting. You need peak performance—trouble-free and fast—in your chain saw. You get it when you specify BlueJet Chains.

BlueJet chains fit all popular saws, and there's a chain for every purpose. Falling, bucking, limbing, pond saws—BlueJet does every chain saw job better. Ask for our precision engineered bars and sprockets, too.

BlueJet Chain Co.
2704 Fourth Avenue South
Seattle 4, Washington
Please send me literature on BlueJet Chains.

Name _____ City _____
Address _____
BlueJet is the Universal Replacement Chain—a Precision Product for More Profitable Production

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WILLARD READY-MIX PLANTS

WITH A COMBINED CAPACITY of 400 cu. yds., these two all Willard plants give Earl Ladd Ready-Mix Concrete Co., the ability to handle any city job and to move hundreds of miles out of town for the high profit jobs that no one else can touch.

PLANT 1. 150 C. Y. CAP. "Have fun and will travel"

Consists of Willard Weigh Batch Loader, Mixer Loading Conveyor and three 3 cu. yd. Willard Truck Mixers. Uses sack cement. No other equipment is required; one operator does the job.

PLANT 2. 250 C. Y. CAP. "Stay at home set up"

Consists of electric operated Willard Weigh Batch Loader, Cement Silo, Mixer Loading Conveyor and 3 to 5½ cu. yd. Willard Truck Mixers.

Whether you need a stationary plant or want to contract for public works jobs it will pay you to investigate the "Willard Way." Write for literature.

Manufactured in Los Angeles,
California and Galion, Ohio

**WILLARD CONCRETE
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READY-MIX

"the Willard Way"

For more facts, use Reader-Reply Card opposite page 18 and circle No. 226

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Here's a REEL that's an
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FOR TYING REINFORCING STEEL,
METAL LATH, WELDED WIRE FAB-
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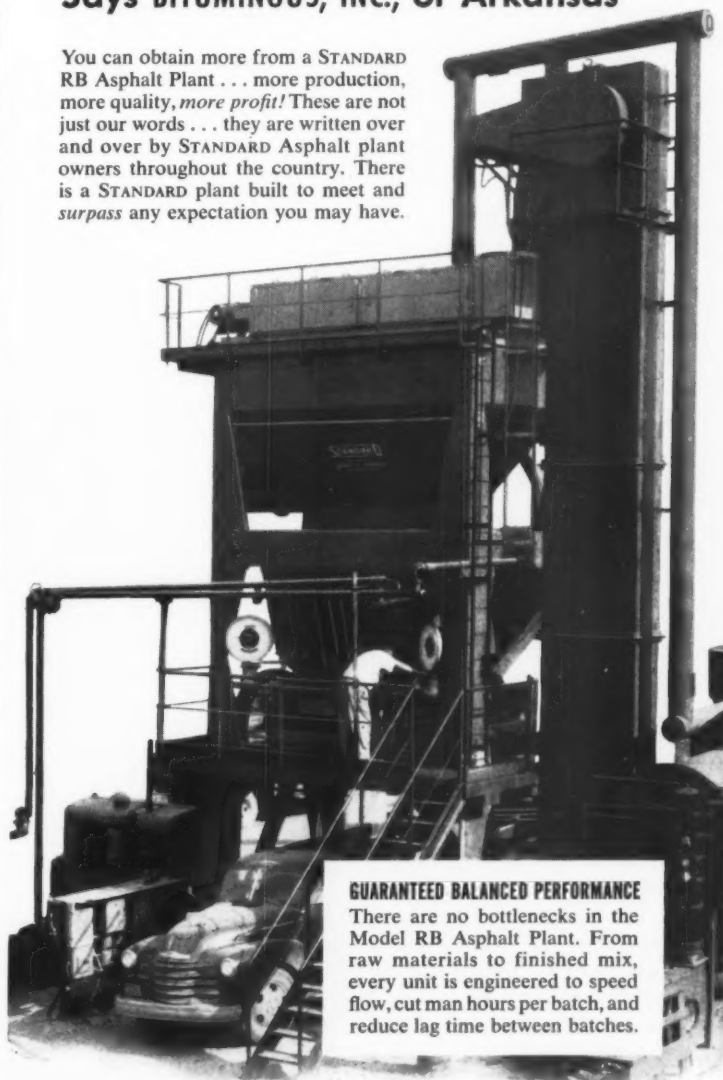
Send me full details about Ideal Reel. Also
quote prices on (specify size and type)
wire.

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"has exceeded our expectations"
Says BITUMINOUS, INC., of Arkansas

You can obtain more from a STANDARD
RB Asphalt Plant . . . more production,
more quality, *more profit!* These are not
just our words . . . they are written over
and over by STANDARD Asphalt plant
owners throughout the country. There
is a STANDARD plant built to meet and
surpass any expectation you may have.



GUARANTEED BALANCED PERFORMANCE

There are no bottlenecks in the
Model RB Asphalt Plant. From
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every unit is engineered to speed
flow, cut man hours per batch, and
reduce lag time between batches.

STANDARD

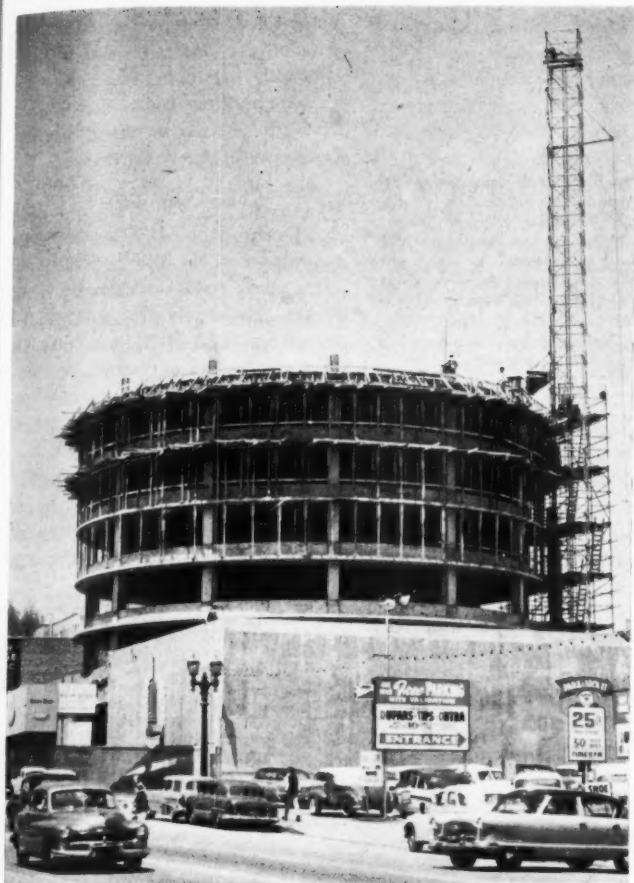
NEW STANDARD RB ASPHALT PLANT CATALOG
Factual, 16-page catalog gives you full details.
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STANDARD STEEL CORPORATION

5007 Boyle Ave., Los Angeles 58 • 15 Park Row, New York 7

For more facts, use Reader-Reply Card opposite page 18 and circle No. 228



Floor disks are supported by 4 x 4 wood shores, which are kept in place
until three succeeding floors have been completed. Concrete and mate-
rials are brought to upper floors by the 225-foot-high Steelform tower.

90 feet in diameter, resting on an
88 x 180-foot rectangular base. Atop
the structure is an 87-foot structural
steel and aluminum spire.

Despite all the modern features, C.
L. Peck, Los Angeles, contractor on
the \$2 million job, had to go back 30
years to select work methods that
would be most economical in the con-
struction of the tower. Concrete was
hand buggied to pours so that heavy
inverted spandrel beams could be
formed without the use of expensive
runways. Wood shores were used so
that form joists, fastened independ-
ently to carry floor forms, could be
released and the shores left in place.
Combined with up-to-date construc-
tion practices wherever possible, these
1925 methods enabled the contractor

to complete a floor level in as short
a time as nine days, while the average
time needed to finish a floor came to
about 12 days.

The new building can claim a num-
ber of "firsts". It is the world's first
building designed expressly for high-
fidelity recording, and it is the first
headquarters established by a major
recording company on the West Coast.
And though it is hard to believe, the
structure is the first fully air condi-
tioned office building in Hollywood.
The Presan steel-reinforcement de-
sign method was used on the tower—
the first time that the method was
used on a circular office structure.

Contrary to widespread belief, the
circular shape of the building, which
(Continued on next page)



A Gar-Bro hand buggy dumps concrete to a floor. Since the inverted spandrel
beams had to be constructed above and monolithic with the floor slab, use of the
buggies did away with the need for expensive runways.

MARCH, 1956



(Continued from preceding page)

makes it resemble a loaded mechanical record player, and the fact that it was built for a recording firm are coincidental. Glenn E. Wallichs, president of Capitol Records, first conceived of the international headquarters at Hollywood and Vine Streets as a modern, rectangular building which, according to him, "would reflect the spirit and vision of the company." His wish was for a unique but highly practical structure.

Choose circular design

The Los Angeles, Calif., firm of Welton Becket, FAIA & Associates, with Murray Erick Associates, also of Los Angeles assisting on structural engineering, chose the circular shape for functional reasons after conferences with Capitol officials.

These conferences disclosed that Capitol's various departments needed between 5,000 and 6,000 square feet of space. This, and the recording company's desire for a distinctive design, started Becket working on a circular structure.

Practical and economical reasons supported the choice. Construction of a circular building was less costly than that of a rectangular building. Heating and cooling requirements of the tower are about 20 per cent less than those in a conventional structure, since the outside wall area is less on a circular building than a conventional structure. Floor space for such services as elevators, duct shafts, stairways, storage areas, and lavatories, which usually take up about 20 per cent of the floor area in a conventional building, are cut to 14 per cent of the floor space in the Capitol tower.

Preliminary study showed that the most practical size for the circular building was 90 feet in diameter. Floors with less than a 45-foot radius would have cramped the peripheral offices and the central core containing the utilities. A radius greater than 45 feet would either waste service and office space, or require a second corridor to serve a second ring of offices.

The 90-foot diameter gives the building 6,300 gross square feet of space. About 14 per cent of this is occupied by service facilities, leaving 5,400 square feet of usable floor space. And this is just what Capitol Records required.

Capitol executives look over work on the underground reverberation chambers where high fidelity recordings will be made. None of the walls in the chambers will be parallel. Left to right are Ed Uecke and James Bayless, chief electronics engineer and vice president in charge of engineering, respectively, for Capitol, and Michael Rettinger, Los Angeles acoustics consultant.

Capitol will occupy about 50 per cent of the space in the building and will lease the remaining office space to business firms. Their address, 1750 Vine St., will be one of the most distinctive on the West Coast.

No shear walls

Although the 88x180-foot rectangular base of the building contains shear walls, these are entirely lacking above the first story in the circular portion of the structure. All loading—gravity or seismic—is taken by reinforced-concrete upright columns and by the 8-inch-thick flat-slab floor slabs.

Both the rectangular portion and the tower are on a series of spread footings averaging 15 feet square and 3 feet deep. Because of differences in

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load, the rectangular portion was separated from the circular tower during construction by a control joint. The cylindrical portion of Capitol Tower is supported by two circular sets of 24×24-inch columns—12 around the perimeter and 6 around the core of the structure. Another set of columns within the core goes around the elevator and stair openings. The second-floor disk has a 78-foot diameter while those above are 90 feet. Becket used this as a device to give a definite "floating" effect to the upper floors.

One of the design innovations used was a photo-reflective stress analysis method—the Presan method—of calculating the steel reinforcement. The Presan method consists of loading a plastic model of a structure with

known loads in various increments.

In this case the floor disks were modeled in plastic of known strength, and one side was finished in a mirrored surface. The disk, without a load, was then photographed through a grid. As loads were applied and the plastic surface became deformed, the stress points appeared accurately on the measuring grid. Engineers then determined the amount of steel reinforcement necessary, and just where it was to be placed. The steel reinforcement in the floor disks formed a radial pattern, and curved bars spanned between the spokes made by the reinforcing bars. The curved bars made of bars larger than size No. 6 were preshaped before being placed, while those smaller than No. 6 were brought

to the floor being constructed and curved before workmen laid them in place.

Forming and concrete

Forming consisted of a combination of plywood and Masonite. The spandrel beam forms used both materials, Masonite being placed on the outside. Since these pours were similar on all floors, the same spandrel forms were used from the second floor through the parapet.

Plywood sheets, with edges accurately trimmed to the proper circumferences, form the underside of the floor disks. The method of setting these forms to support the slabs until the concrete developed high strength gave the architects and the contractor some concern at first. In

structural engineer Murray Erick's experience, stripping done too early resulted in bad deflections. Conferences between the architect and contractor groups resulted in the adoption of the shoring method used 30 years ago by contractors.

Closely spaced 4×4 upright fir shores were used, topped by a small 4×4 piece of smooth-faced ¾-inch material that rested against the concrete until the shores were removed.

Then 2×6 fir stringers were fastened to the sides of the shores. These stringers were topped by 2×4 joists that carried the ¾-inch plywood decking. To insure that floors would be perfectly level after they were stripped, a ¾ inch camber was allowed in the center of the outer ring of each slab and approximately ½ inch between the geometric center and the inner row of columns. This compensated for deflection so well that it turned out perfectly—precise level shots on finished floor slabs were within 1/16 inch of each other, and many were flat on tolerance.

Specifications required the shores to remain in place at least seven days after three succeeding floors had been completed. But forms were stripped after 7 days, providing the shores were still in place. Forms were easily released by removing stringers and joists, leaving the shores in position. In most cases the shores supported the concrete about 36 days, but in one case they stayed in place 45 days.

A 225-foot-high Steelform tower, with an electrically-powered American Hoist & Derrick Co. two-drum hoist, was used to carry materials and concrete to floors being constructed. Challenge truck mixers hauled the regular 3,000-psi concrete from the transit-mix concrete company's commercial plant and dumped the material to the tower bucket. This bucket hoisted the concrete to a Gar-Bro transfer hopper, and Gar-Bro hand-pushed buggies took the concrete to its point of placement. Viber electric vibrators consolidated the mass, and a light steel troweling finished off the slabs.

The use of old-style concrete buggies instead of powered carts saved construction of expensive runways on this particular job, because of the inverted spandrel beams which had to be constructed above and monolithic with the slab.

H. B. Wrightmire, project manager for C. L. Peck, established good continuity in concrete work—in spite of the fact that the job was so different—by training a select crew of carpenters and concrete men.

On the several days each craft was idle on a particular floor, other men were at work. Wrightmire kept his gang together by transferring idle men to other building jobs C. L. Peck had under way in the Los Angeles area. Then, when the next floor was ready, the men were brought back and, since each man knew exactly what to do, no time was lost in constructing the next highest floor. There was no labor turnover during the course of the job.

The finishing touches given the

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building emphasize its modern design. Floors were finished with asphalt and rubber tile and ceiling were finished with acoustical tile, after both had been machine-plastered with a mixture of plaster and vermiculite aggregate. Zolatone and Gelvatex were used to finish exposed concrete portions. Persons entering the building will pass through a lobby finished in stainless steel and travertine marble, and Otis fully-automatic elevators will whisk them from floor to floor. Offices have sash and mullions of aluminum, and blue sunshades keep the glare of the sun from employees. Window shades consist of tubular frames covered with porcelain enamel.

Personnel

Assisting H. B. Wrightmire on C. L. Peck's operations were general superintendent A. B. Standard. William Murphy was job superintendent. John Fish was Welton Becket's representative, and Ted Niederhoffer represented Capitol Records on the job.

THE END

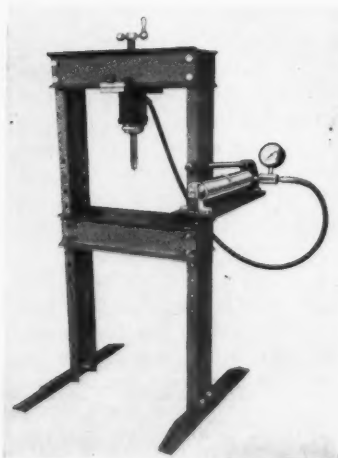
Maintenance puller-press shipped ready to assemble

■ Owatonna Tool Company is now offering what it calls a special "do-it-yourself" 17½-ton press. The press is delivered with pins, bolts, spacers, ram holding plate, channels, and angles pre-cut to size and shipped broken down. The buyer drills the prick-punched holes, and paints and assembles the unit, saving assembly cost.

The press design and materials are the same as those found in the OTC Power-Twin standard press, No. Y106-A. This unit is designed to do a large number of pulling and installing maintenance jobs on heavy equipment. The power head available for the press, an OTC Power-Twin hydraulic unit, is not part of the press. It can be removed from the press and used with the various OTC pulling sets.

The press is 58 inches high, 23½ inches wide and requires a floor space of 28 x 27½ inches.

For further information write to Owatonna Tool Company, 381 Cedar Street, Owatonna, Minn., or use the Request Card at page 18. Circle No. 155.



The OTC 17½-ton press, which the buyer assembles himself, saving assembly cost.



FAST AND CONVENIENT to operate, the Ramset fastening tool speeded the renovation of a 24-story New York City office building. The powder-actuated tool was used for securing steel anchorages to structural beams holding a new aluminum facade. The superintendent on the job noted that one man could set 15 studs in the time it would take two men to drill one hole by conventional methods. For further information write to Ramset Fasteners, Inc., 12117 Berea Road, Cleveland 11, Ohio, or use the Request Card at page 18. Circle No. 127.

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IN THE RADICALLY NEW, profit-making Fruehauf-Schonrock Cable Volume Dump Trailer, both costly hydraulic hoist mechanisms and heavy, conventional chassis members have been removed. Simple, low-cost, easily-operated cables, and the Fruehauf-Schonrock Booster Fifth Wheel Unit have been substituted, limiting movable parts to only five in number! The results are more payload and much lower initial cost!

Because of Bridge Formula rulings, every additional foot of Trailer length provides usable payload capacity

with the Volume Dump. With Cable Dump design it is possible to extend the body and thus attain maximum length from cab to rear axles—all loadable. And the body itself carries the weight . . . while one small winch mounted on the tractor dumps it.

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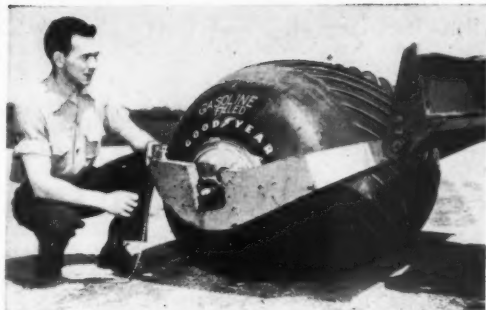
**HIGHER HAULING PROFITS AND BIG ON-THE-JOB SAVINGS
FOR ROAD BUILDING AND CONSTRUCTION FIRMS!**

CONTRACTORS AND ENGINEERS

Melon-shaped rubber tank is rolling fuel supply

■ A watermelon-shaped rubber tank has been developed by the Aviation Products Division of the Goodyear Tire & Rubber Co., that offers a method of bulk transportation and storage of fuels and other liquids. Called the Rolli-Tanker, the container can be rolled over ground, floated in water and dropped without bursting.

Rolli-Tankers are unconventionally-shaped tires of nylon cord and tread stock construction with fuel-proof inner linings. They can be built in a range of sizes. To date the company has tested 3½ x 5-foot tanks that weigh 40 pounds deflated and give the appearance of oversized



Mounted on hubs and an axle, the Rolli-Tanker makes an easily transported fuel supply that can be towed behind a vehicle.

watermelons when loaded to 250-gallon capacity.

Mounted on hubs and axles to permit easy handling, Rolli-Tankers may be towed manually or by vehicle. The containers have excellent flotation characteristics because of extremely low ground-bearing pressure. Only 30

pounds of drawbar pull—easily supplied by one man—are needed to roll the storage units.

Filled Rolli-Tankers can be towed either singly or in tandem arrangements behind any vehicle equipped with a trailer hitch without affecting the vehicle's gross weight. Having a

natural buoyancy, they can be floated down rivers and across lakes when filled properly.

During recent tests conducted by Goodyear's Aviation Products Division, fully loaded tanks were dropped 15 feet without bursting.

For further information write to the Goodyear Tire & Rubber Co., Akron 16, Ohio, or use the Request Card at page 18. Circle No. 148.

Auger bores frozen soil

■ A boring tool that cuts its way through frozen soil, hard packs, and most other difficult terrains, including many solid rock formations has been reported by Alaskaug, Inc., 620 Kieth Bldg., Cincinnati 2, Ohio.

This auger has a tapered helix of chrome-molybdenum steel with a series of heavy-duty cutting bits



The holes for thousands of piles and poles set in hard permanently-frozen tundra in Alaska were bored by a specially developed auger, the Alaskaug.

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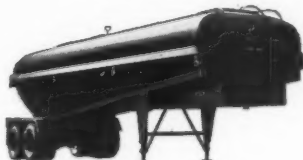
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stepped around the edge of the spiral and a hollow mill cutting head in place of the conventional piercing point. The drill head and bits are tipped with sintered tungsten carbide, similar to modern high-speed machine tools, to provide tough, durable, cutting edges.

The Alaskaug auger has been used extensively in Alaska to bore thousands of holes required for Operation DEW. This is the radar web being built across the northernmost part of the Western Hemisphere.

It is reported that in everyday field use the auger has been regularly boring permafrost, coral rock, limestone, and sandstone. It has even bored through solid blocks of cast iron.

For further information write to the manufacturer, or use the Request Card that is bound in at page 18. Circle No. 158.

Radiographic projector test metal joints

■ The new Kel-Ray radiographic projector for testing pipe connections in the field and for construction and welding use is featured in a bulletin. Manufactured by M. W. Kellogg Co., and sold by Metal & Thermit Corp., this portable projector comes in three sizes.

Special safety features guard against damage from fire, water, sudden shock, and tampering.

To obtain Bulletin P-196 write to Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 84.

Contracts, general conditions, plans and specifications

Contract documents consist of the contract, the general conditions of the contract, the plans and specifications, and in some cases, the proposal. Contract agreements are generally in one of four forms—the lump-sum contract, cost-plus-percentage contract, cost-plus-fixed or sliding-fee contract, and unit-price contract.

The lump-sum contract is a fairly simple agreement covering construction for a definite sum. Detailed plans and specifications are prepared in advance, and submitted to contractors for bids. Then contractors prepare estimates, submit them on a predetermined date, and the work is usually awarded to the lowest bidder.

Cost-plus-percentage and cost-plus-fixed-fee contracts are forms of service contracts. Under the former, the contractor is paid the actual cost of the work, plus a percentage of the cost to cover overhead and profit. The cost-plus-fixed-fee type of contract is essentially the payment of a definite lump-sum fee or sliding fee, depend-

ing on whether or not the contractor guarantees the cost of the work.

The unit-price contract has a contractor agree to do certain parts or all of the work for a definite price per such unit as cubic yard, or square yard.

The lump-sum contract is the best type to use, since it demands a careful study of work to be done, and has the effect of holding costly mistakes to a minimum. It guarantees the owner a completed structure at a definite predetermined price, reduces extras to a minimum, aids efficiency, and guarantees not only the quality of the work but the time in which work will be completed.

Contract forms

The AIA "Standard Form of Agreement between the Contractor and Owner for the Construction of Buildings" is a form used for lump-sum contracts that has the approval of AGC and many national trade associations. Its wording, terms, and conditions are familiar, rendering it particularly valuable. This contract is to be used only with the AIA standard general conditions of the contract for the construction of buildings. The latter document contains all conditional clauses and requirements.

The AIA form for short construction contracts is recommended when work is simple in character, small in cost, and when a stipulated sum is the basis of payment. It is not used in conjunction with the long form of the General Conditions of the contract, and contains only 20 articles in contrast to the 44 used by the long form.

The AIA's general conditions form should be studied carefully, since its provisions cover many functions performed by superintendents or project managers. Each of the 44 articles, requirements for supervisory action, may be reduced to a routine, and most of the material covered by the articles is self-explanatory. However, a careful study will show clearly just where the contractor's responsibility begins and ends. One of the articles particularly important to note is the one on shop drawings. It is important to note that architect's approval of shop drawings is always qualified, the majority not holding themselves responsible for the accuracy of such things as detailed dimensions. Since the contractor takes responsibility for the dimensional accuracy of the drawings, it is a good practice for the superintendent or project manager to have his own drawing check made before transmitting the drawing to the owner's representative. If necessary, he can call attention to matters that need correction or approval.

Again, though the owner has to fur-

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by **GEORGE E. DEATHERAGE, P. E.**
Construction Consultant

This is the third of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent and who need practical help in order to take complete charge of construction projects themselves.

nish and pay for all surveys, there will be cases where the contractor will be requested to do so. The main precaution to take is to make sure that work is done by a qualified licensed surveyor. It is not wise for engineers connected with the city building department to make surveys and establish lot lines, for if an error is made, he cannot always be held responsible.

As with the proposal in the preceding article, check and recheck all clauses covering insurance, building codes, liquidated damages, and extra work. According to the "Notes of General Conditions of the Contract" as issued by the AIA, the articles, as printed, do not include all the necessary general conditions of the contract. Conditions may be added, though some of them are better placed in the specifications for various trades. Others, though suited for inclusion in the general conditions, are not always needed. They include such things as bracing buildings during construction, charges for extra copies of drawings, heating during construction, permission to use articles or methods other than those specified, scaffolding, stoppage of work in freezing weather, and watchmen. Two books of particular value in preparing such documents are "Handbook of Architectural Practice", published at \$5 by the AIA, and "Legal Phases of Construction Contracts" by Vernon Werbin, which McGraw-Hill has published at \$4.50.

Fees or percentages

The cost-plus-fee and the percentage contracts form, "A Circular of Information Relative to the Cost-Plus Fee System of Contracting for Building Construction" should be used with the AIA form on a cost-plus fee contract or with a cost-plus-percentage contract. The AIA does not issue a separate standard form for the latter type. The wording of the article on the fee for services has to be altered to meet the percentage payment stipulations. The general conditions and other clauses remain the same.

Basically a fee or percentage will vary as to the type of work, the hazard to be encountered, the percentage of labor, and the size of the contract. If the work is unusually hazardous, the contractor is due an increased fee or percentage as a hedge against accidents. If the work involves practically all labor and a small amount of materials, the profit will have to be increased on the labor to make up for the lack of materials on which overhead and profit will ordinarily be added. The amount of the profit fee or percentage will vary,

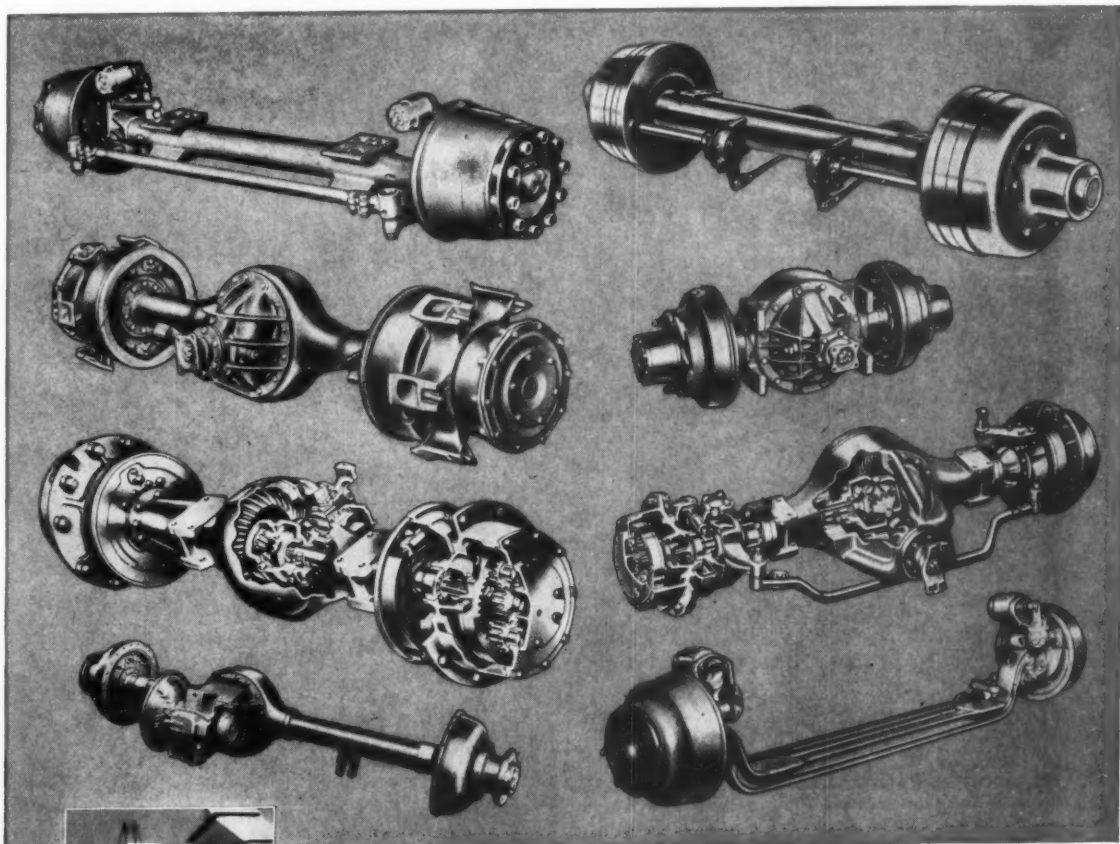
the cost of the work being higher on smaller jobs.

The nature of the fee or percentage may be in a definite lump sum, it may be a lump sum with a guaranteed maximum, a variable lump sum or sliding fee, or a variable lump-sum split-profits contract. The latter has the fee decrease if the contractor runs

over cost. On all these cost-plus-fee contracts, the fee should include any design or working drawings provided by the contractor. The cost-plus-percentage and a guaranteed maximum, variable percentage, added percentage for design, are all variations on the cost-plus or percentage contract.

On cost-plus-fee or percentage contracts, the contractor should have enough information on the general description of the work, dimensions of the structure, quantities, time schedule, any unusual conditions, labor conditions, and estimated total expenditure to bid intelligently.

Working with cost-plus-fee or per-



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- off-highway vehicles—specially designed heavy-duty drive axles, steering and non-steering, for industrial machines;

- axle-transmission drive units for agricultural and industrial applications
- fork-lift trucks—axles designed for materials handling equipment
- housing—light, exceedingly strong, one-piece forging, heat-treated

What is your need in that vital area of "durable legs?" In Clark axles you get the solid cash benefits of 50 years concentration on transmitting horsepower to wheels: efficiently, economically, durably.

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centage-type contracts, contractors are sometimes required to present a prequalification statement before they will be considered as bidders. Many large private concerns follow this policy. The basic information required includes the state in which the firm is incorporated; the amount of working capital on hand; a list of recent jobs; references to architects, engineers, and owners; banking references; principal work on hand; work previously handled on a fee basis; equipment owned; persons authorized to act for the firm; and facilities for making quantity survey from plans and specifications. The same infor-

mation is required from subcontractors by the contractor's purchasing department.

This type of contract is very flexible concerning changes in work while the job is in progress. This can be done without seriously affecting the cost, and is one of the basic reasons why such a contract is used. Drawings and work may be in production simultaneously, as often happens on large plants, and yet changes which develop may be acted on quickly without making up cost estimates and securing extra work order approvals. If work is hazardous—say on a chemical plant—each revision of drawings and specifications should be shown in a change order so that in case of fire or explosion, the contractor can establish that the work was installed

exactly in accordance with instructions.

Costs and billings

The cost-plus-fee or percentage contract is one in which the contractor is, for all practical purposes, the owner's agent, and the fee or percentage in most cases is based on the actual cost of the work. Under this contract it is necessary to be much more meticulous in keeping and recording costs so that proper billings can be made and vouchered. Some costs will be part of the fee or percentage; others will be billed as the actual cost of the work.

The fee should be billed monthly, along with the regular billing for labor and materials. If it is not billed in its entirety, it should be billed to

at least 90 per cent of the amount due, particularly if the contractor does not make any guarantee as to the financial cost of the work. The manner of payment will vary for each type of contract.

Costs to be reimbursed should be carefully handled. This will include all labor on the contractor's payroll, although purchasing, accounting, and other services in the contractor's office comes out of the fee or percentage. Transportation, travel, hotel expenses, permits, royalties, losses, minor expenses, cost of hand tools, can all be reimbursed. The latter, one of the most troublesome items, may be simplified on small work if the contractor makes allowance for it in his fee. Also included under reimbursable costs are materials, supplies, equipment, amounts of all subcontracts, premiums on all bonds and insurance policies, and rental of construction plants.

Among costs which cannot be reimbursed are: the salary of the contractor, salaries of persons employed in the main office, overhead or general expenses, and interest on capital used. It is a general practice under this type of contract for the owner to keep on deposit with the contractor a stated sum for securing cash discounts. If the contractor advances funds to secure the discounts, the saving should go to the contractor rather than the owner. If such a provision is not made when the contract is prepared, the contractor's fee should be increased slightly to provide for the additional financing needed.

Field office records should be prepared and distributed so that the owner's representative automatically receives copies. If his signature appears on all receipts, vouchers, payrolls before they go to the accounting department, trouble will be avoided and partial payments and the final audit will be facilitated.

In making monthly billings, certified copies of all receipts, vouchers, payrolls, invoices, must accompany the billing. The cost of this work is often borne by the contractor and should be kept to a minimum. Securing certificates of payment on private work can become routine if all paper work is done properly. On government contracts, more detail is involved. Applications must be made on government forms and affidavits, all of which have to be certified by the engineer in charge before being presented to the general accounting office. It is advisable to delegate one man to work with engineer in charge in preparing the application, presenting it personally to the accounting office, and making any corrections demanded.

If work is done on a cost-plus-fee or percentage basis and the contractor is also the architect or engineer, it is not feasible to use the AIA "Form of Agreement Between the Contractor and Owner" in conjunction with the AIA form of the General Conditions of the Contract. In such a case, the firm must revert to some such form as the proposal-acceptance agreement on a fee or percentage basis. As with

Allis-Chalmers Scraper and Tractor Fleet Moves Four and a half Million Cubic Yards



Four HD-16 tractors with 20-cu. yd. Allis-Chalmers scrapers level a hill to make a large fill. Torque converter drive helps units return uphill fast for next load . . . cut valuable time from every cycle.

Never an idle moment for Allis-Chalmers tractors—when not push-loading they are busy dozing. An HD-21, right rear, compacts earth with a sheep's-foot roller.



Motor Scrapers and HD-21's and HD-16's with pull-type scrapers level steep grades on Millbrae project near San Francisco

In leveling 50 acres of rugged California hills to complete its Millbrae housing project just south of San Francisco, Trousdale Construction Co. is moving 4½ million cubic yards of earth—with over a million cubic yards to be placed on a single fill.

To handle the job, Trousdale called on Tecon Construction Co. of Dallas, Texas. Tecon called on its fleet of Allis-Chalmers torque converter drive crawler tractors—six HD-21's and six HD-16's. In addition, Tecon brought in a fleet of Allis-Chalmers pull-type and motor scrapers to do the dirt hauling.

On this big project, the HD-21's and HD-16's are overcoming steep grades and stubborn hills. One reason: torque converter drive which makes full use of maximum engine horsepower . . . automatically matches tractor speed and pull to load and terrain conditions . . . provides outstanding operat-

ing ease . . . eliminates engine stalling and most shifting, reduces shock and strains to power train.

Other reasons: Allis-Chalmers diesel engine design causes exploding fuel to exert follow-through push on the pistons . . . provides maximum leverage when crankshaft is at most favorable angle . . . eliminates combustion knock, gives complete, clean combustion and more usable power per drop of fuel.

As the going gets tougher on this job, other HD-21 and HD-16 advanced design features show their superiority: all-steel box-A main frame, 1,000-hr lubrication, straddle-mounted final drives, Tru-Dimension machined and hardened track—all help these big tractors deliver the goods in output, dependability and service simplicity. Let your Allis-Chalmers dealer prove it!

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



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make sure that they are properly the lump-sum contract, all service contracts should be read carefully to worded, contain all information, and cover as many contingencies as possible.

Bid bonds

Generally, before a contractor can secure any type of bond from a recognized surety, he has to establish his credit by making an application for bond on the surety's standard form. A copy of the contract, specifications, and other documents may also be required. These are referred to and made a part of the contract to be bonded. The surety may also require a financial statement. Once credit arrangements have been made, securing bond is a matter of routine.

A bid bond is a guarantee that the contractor will enter into formal contract with the owner on penalty of forfeiting the amount of the bond. A certified check may sometimes be requested instead of a bond, and if the contractor's bid is not accepted, the check is returned, or the bond cancelled automatically.

A performance bond, guaranteeing completion of the work at the contract price, is nearly always issued in the full amount of the contract, although it may be split into two parts, the performance bond and the payment bond. Application for bond, if accepted by the surety, is in reality a contract between the contractor and the surety, which attempts to save the surety harmless should the bond be invoked. Street paving, highway, culvert, and bridge construction bonds are designed specifically for work to be done for federal, state, county, borough, township, and municipal owners. Generally they run for 24 months at $\frac{3}{4}$ to 1 per cent premium, and renewals may be obtained for $\frac{1}{2}$ of 1 per cent. Separate bonds can be secured for curb and guttering at about the same price.

Bonds covering specially designed and fabricated materials can be secured at a cost of about $\frac{3}{4}$ of 1 per cent of the value. For the standard materials, the cost should not exceed $\frac{1}{5}$ of 1 per cent of the value. Various types of maintenance bond, including those for highway construction maintenance, may be secured at costs which vary slightly from locality to locality. The contractor can, of course, secure performance and payment bonds on a subcontractor's work, particularly if the subcontractor is unknown to him or the subcontract price is unusually low.

Subcontracts

Subcontracts under the cost-plus-fee or percentage contracts may be made by either owner or contractor, and need not be on a cost-plus basis. But they should refer to the general conditions of the contract and be made a part thereof, and should refer to plans and specifications covering the work.

There are a considerable number of items not specifically covered in the Contract General Conditions. Some architects and engineers add these to the document, others carry them as

part of the specifications.

If a subcontract is let on a cost-plus basis, under a cost-plus-fee or percentage contract, it is not necessary to state and define these additional items as clearly as would be necessary if a contract were let on a lump-sum basis.

These items are grouped here under "The General Conditions of the Specifications". In practice, these are part of the specifications which the architect may also make applicable in specifications for the general contractor.

General conditions

These general conditions cover proposals, work to be done, future extensions, drawings and specifications, examination of premises, unforeseen

conditions, and lines and grades. Provisions for protecting the work—which includes employment of watchmen, protection of trees and shrubs, notices to adjoining property owners, protection of equipment and work, loss by bad weather, liability and fire insurance, liens, surety bond, maintenance bond, time of completion, alterations or additions, and contractor's decisions are also covered.

Responsibilities of the contractor concerning temporary construction, provision of needed facilities, use of premises, movement of materials, installation of equipment, and cleaning are also set forth.

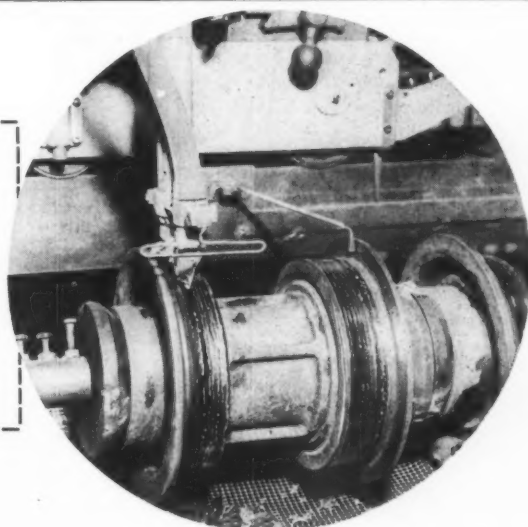
Not all these specification conditions will be necessary for every project. Yet all of these, if required by the job, must be considered in listing

overhead items included in the estimate. In using the General Conditions of the Specifications make sure that the clauses do not conflict with the general conditions of the contract, to which both contractor and subcontractor are bound. Specifications usually consist of three parts—the General Conditions of the Specifications, Specifications for Individual Buildings or Plant, and Specifications for Individual Trades. These may be separate documents, or they may be combined in a single document under the general heading of "Specifications for the Work". Each page of the specifications should be identified in the contract agreement, if this is at all possible, but this is not as necessary on cost-plus-fee or percentage contracts as it is on lump-sum con-

Does it pay to REBUILD TRACTOR ROLLERS?

here's one answer...

This is a report from one of the country's largest tractor maintenance shops having complete facilities for crawler reconditioning. It particularly concerns rebuilt track rollers, a major item of wear. In this shop rollers are regularly rebuilt and hard-faced by the automatic electric welding process, using Stooddy 105 on the running surface and flange.



About a year ago a tractor came into the shop for overhaul. The rollers were badly worn; those found suitable for rebuilding were returned to size with Stooddy 105 and the internal assemblies thoroughly reconditioned. The balance of the rollers were discarded and replaced with standard parts. Following routine procedure, the shop foreman checked the entire crawler assembly to insure proper alignment—a highly important factor in reducing needless wear. After 2500 hours this tractor came in again for its customary overhaul. Inspection of the rollers disclosed the following:

The standard rollers, without exception, were worn from $\frac{3}{8}$ " to $\frac{1}{2}$ " on the running faces; in all cases the internal assemblies required several replacement parts.

Hard-faced rollers showed negligible wear on running surfaces and the only replacements needed were new seals for internal assembly.

It is of course an accepted fact that rollers rebuilt and hard-faced with Stooddy 105 by the automatic method give a service life considerably beyond that of standard replacements—at a much lower cost. The hard-faced roller with its superior abrasion resistance reduces uneven wear on the track rails by providing a smooth,

even working surface that allows free movement of the rails and resists grooving of the roller. Hence, wear on the internal roller assembly is also decreased.

Stooddy 105, the alloy used in this application, was the first automatic wire of its type and is today the alloy generally preferred by principal shops. It has been proven by eight years of actual field use—assurance of maximum service life at reasonable cost.

Earth-moving contractors operating large fleets of tractors, shovels, buckets and crushing plants often find the installation of an automatic welding head a profitable investment for rebuilding rollers, idlers, house rolls, crusher rolls and similar wearing parts. Many contractors, however, prefer to send such work to a thoroughly equipped automatic job welding shop of which there are a number located throughout the country. A list of these job shops is available on request.

Complete information on automatic hard-facing installations and procedures will gladly be supplied—without obligation. You may consult your local Stooddy dealer—see the "yellow pages" of your phone book under "Welding Equipment and Supplies"—or write direct.

STOODDY COMPANY

11936 East Slauson Avenue, Whittier, California

See the STOODDY EXHIBIT — WELDING SHOW — Buffalo, N. Y., May 9-11.
For more facts, use Reader-Reply Card opposite page 18 and circle No. 234

management

tracts and subcontracts. Basic and detailed requirements for the preparation of specifications will be covered in a future article on the engineering department.

Specific trade specifications are prepared in detail for each portion of the work. Many contractors have established what are termed "Master Specifications" for each trade, and many government agencies and state and city commissions issue the master specifications to bidders, following these with "addendums to the specification". These set forth alterations or additions.

If a lump-sum contract is used, plans are prepared in advance and become part of the contract documents. This may also be true on a cost-plus contract, but there are cases where contracts are let and plans are still unprepared, these being of the cost-plus-percentage or fee basis, without a guaranteed maximum cost. Naturally, no contractor can bid a lump sum or guaranteed maximum cost when plans are incomplete.

Where plans exist and are to be made part of the contract, be sure each sheet is identified by the signature or initials of the contracting parties.

(Next month's article will deal with "The contractor's general and departmental organization")

Auger-scoop transfers dry and liquid materials

■ An auger that lifts water, sand, or loose earth, and transfers mixed concrete or cement into forms, has been announced by Dultmeier Mfg. Co., Manning, Iowa.

The Auger-Scoop, designed to operate at any angle, is powered by



The Dultmeier auger-scoop

either an electric motor, gas engine, or ½-inch electric-drill. It is adjustable from 16 to 21 feet, and is 4 inches in diameter.

For further information write to Dultmeier Mfg. Co., Manning, Iowa, or use the Request Card at page 18. Circle No. 112.

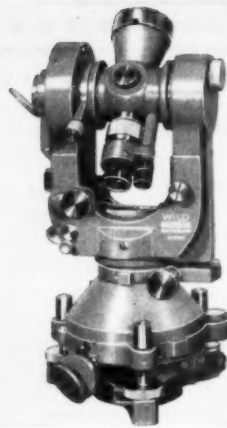
Napco admitted to AED

The construction equipment division of Napco Industries, Inc., Minneapolis, Minn., has been elected to membership in the Associated Equipment Distributors, a national organization of manufacturers and dealers of heavy equipment. The division makes heavy-duty front-end loaders.

Theodolite accessories save time and manpower

■ Ten accessories, electrical illumination and distance measuring with the use of the Wild Invar subtense bar give the Wild T-2 Universal Theodolite precision and versatility, according to its manufacturer, Wild Heerbrugg Instruments, Inc., Main at Covert Sts., Port Washington, N. Y.

Major accessories include targets for precise traversing with automatically controlled centering, optical plumb line, precision range finder, eyepiece prisms, diagonal eyepieces for observations under very high



angles, and a striding level for direct measurement of trunnion inclinations. Attachments for determination of meridian, longitude and latitude, and a base plate so that the instrument can be set up on a pillar are others.

Adapted for triangulations to the third and second order and for precise surveys of all kinds, the Wild T-2 features a clear telescope with internal focus and coated lenses. A single microscope alongside the telescope makes circle reading simple. Direct reading to 1 second can be made on both circles.

For further information write to

NOW *bid beating... dirt heaping...*

1950

10% bigger payloads!

Model "75" ... boosted to 20 yds heaped (without sideboards) ... 262 hp.

Model "55" ... boosted to 14 yds heaped (without sideboards) ... 172 hp.



Wide-base tubel tires and windshields shown, available optional equipment

- 1 Wider "Target" Push-Block** makes it easier to make and maintain contact. Helps to cut loading and cycle time.
- 2 Straight-Line Ejector Reeving** requires minimum power; leaves more power on Payscraper wheels for faster dumping and spreading. Also speeds re-threading time.
- 3 Sturdy Cover Plates** protect new, stronger cylindrical ram and air tanks.

- 4 New, Straight-Back Bowl** lets you heap and haul more dirt every trip. Struck capacity, with sideboards, 18 cubic yds on "75"—12 cubic yds on "55".
- 5 Higher Apron Lift,** bigger apron opening, provides cleaner, more rapid dumping, especially of "sticky" materials.
- 6 Fast-Acting Apron,** arms mounted outside bowl, assure quick, positive closing of apron. Payscraper holds the load from cut to fill.

- 7 Lowered Draft Frame** provides operator with "control tower" visibility of bowl and push-tractor ... also helps direct push and pull power more efficiently to cutting edge for faster loading.

- 8 Larger, Wider Fenders** give greater safety for operator, greater protection for machine.

For direct
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the manufacturer, or use the Request Card at page 18. Circle No. 38.

Case histories describe use of grid roller

■ The advantages of the Hyster grid roller for embankment compaction, crushing and compacting pit-run rock for surface or base courses, and salvaging deteriorated bituminous road surfaces are explained in two new booklets.

Job data is presented to illustrate money-saving features. One survey cited reports that Sutter County, Calif., saved \$4,760 by reclaiming the

material in 1½ miles of bituminous road. Another report describes use of the grid roller in crushing limestone rock to 2-inch minus. Cost of the crushing proved to be under twenty-five cents per cubic yard.

To obtain Booklet Nos. 1374 and 1375 write to the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 182.

Air-operated hammer features stop rotation

■ A simple external cam lever control permits instantaneous change

from rotative to straight hammering action in the new Thor No. 15 air-operated utility hammer. Using rotation for drilling in stone and concrete, the tool converts to straight hammering action for starting holes, chipping, light clay digging, and demolition work.

The tool is available in two models, the 15D, used as a dry tool, and the 15W, as a wet tool. Over-all length is 17¼ inches, with ¾-inch air hose. The standard chuck supplied is a ¾-inch hexagon by 3¼ inch for long shank accessories. Both models cut up to 1½ inches in diameter.

Accessories for this hammer are



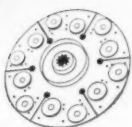
The Thor Model 15 utility hammer, featuring easy changeover from rotative to straight hammering action, enables the operator to use the tool alternately as a rock drill or chipping hammer.

50 International Payscrapers



Put the 1956 International Payscraper to work on your job, and watch dirt boil up into its new, straight-back bowl. You've never seen any big scraper load as easily or as fast. In seconds, you've packed in up to 23 heaped yards. Its offset 3-section blade breaks the ground like a sharp-pointed spade. Dirt boils from the smooth-slicing cutting edge and fills the corners to build a full heaped load. Close the apron instantly, positively, on this huge, well-compacted load and you carry all the dirt you've heaped in.

Now, drive easily, effortlessly with safe hydraulic power steering at a fast clip to the fill. Note how the 1956 Payscraper's extremely high ratio of horsepower to capacity and its rapid acceleration to 24 mph top speed add up to more trips per hour than any other self-powered scraper you've ever used. Yes sir, it's a real profitable dirtmover, this 1956 Payscraper! Try one yourself on your job! See your International Industrial Power Distributor for a demonstration.



New, Long-Lasting Clutch

of ceramic material and powdered metals, successfully resists heat and wear over longer periods. Available on Model 75 only.

Adjustable 3-Piece Cutting Edge

for clean, fast cutting and loading under all soil conditions.

tubel
indsbi
ilable
uipm

control
vl and
direct
re eff
e faster

erator
chine



International Industrial Power

INTERNATIONAL HARVESTER COMPANY, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors... Self-Propelled Scrapers and Bottom-Dumps... Tractor and Rubber-Tired Loaders... Diesel and Carbureted Engines... Farm Machinery... Motor Trucks.

rock drilling steels and bits, paving breaker moil points, clay digger spades, and adapters permitting use of a wide assortment of standard star drills and chisels.

For further information write to Thor Power Tool Co., 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 32.

Metal-cleaning process

■ The Phosteen process, a new method for simultaneously cleaning and phosphatizing metal surfaces prior to painting, is announced in literature by the developer, Neilson Chemical Co. A chemical, which is applied by a steam gun, provides corrosion resistance to the metal, according to the manufacturer. Phosteen can be used on trucks, road machinery, or heavy equipment having ferrous metal, aluminum, or zinc-coated surfaces.

The equipment needed, material used, and mixing proportions are covered in the literature.

To obtain this literature write to Neilson Chemical Co., 6564 Benson St., Detroit 7, Mich., or use the Request Card that is bound in at page 18. Circle No. 59.

Centrifugal pumps

■ Two to eight-inch centrifugal pumps with gph ratings from 7,000 to 125,000 are pictured in a catalog from Rice Pump & Machine Co. Complete specifications, outstanding features, and accessories are detailed.

To obtain Bulletin 55 write to Rice Pump & Machine Co., 400 Park Ave., Belgium, Wis., or use the Request Card at page 18. Circle No. 21.

For more facts, circle No. 235



A Euclid scraper dumps a load of material on the runway subgrade as grading operations near completion. A scraper spread and a loader and haul unit spread moved the required 400,000 yards of material in 40 days.

C&E Staff Photo

Forest Remover



A new machine . . . a new system . . . for economically converting wooded wasteland into productive earth

This is the LeTourneau TREE CRUSHER . . . a 110-ton steel monster whose heavy, cleated rollers crush big trees and thick undergrowth alike. It leaves a wake of splintered wood and compacted debris — ready for burning. Forest leveling by Tree Crusher is one of several new approaches to mechanized land clearing available in a line of specialized equipment manufactured by LeTourneau.

This new concept of land clearing . . . fast, efficient forest removal . . . is made possible by application of the LeTourneau system of electric power and control to massive land clearing machinery. The Tree Crusher and other LeTourneau specialized land clearing equipment generate their own power and transmit it directly to locally-placed, direct-gear electric motors at the wheels and other working parts. The result is more power, speed, and maneuverability than ever before available for land clearing operations.

Today these specialized LeTour-

neau machines are establishing new work records on big land clearing jobs: The huge *Tree Saw* which flush-cuts big trees; the *Tree Stinger* which pushes the biggest trees out by the roots; the *Tree Crusher* which uproots average size trees and stubborn stumps. The newest LeTourneau Land Clearing Machine is a *Powered Disc Plow* which slices through the earth, destroying root systems and stumps.

These are machines you'll want to consider for your big land clearing jobs. Send today for your copy of the booklet, "Roots Out or Cut Flush."



SINCE 1929 — R. G. LeTourneau, Inc., has built BIG equipment for 26 years under the same corporate structure. In 1953 LeTourneau sold part of its business, retaining plants in Longview, Texas, and Vicksburg, Miss. Today LeTourneau creates and produces electrically powered and controlled equipment for logging, land clearing, and off-road transportation.

LETOURNEAU
R. G. LeTOURNEAU, INC.
2753 S. MacArthur, Longview, Texas



Equipment
C-107

For more facts, use Reader-Reply Card opposite page 18 and circle No. 236

Contractors work fast to build fighter base

Grading is completed in 40 days, setting a fast pace for construction of a new Air Force interceptor base

When the Air Force indicated that its new jet-interceptor base near Minot, N. Dak., would have to be built in a hurry, Peter Kiewit Sons' Co., Omaha, Nebr., picked up the challenge and set the pace for the rush job, completing excavation and subgrade preparation for the 8,100 x 150-foot runway in 40 calendar days.

Construction of the granular base started immediately, and other phases of the project came into line as fast as plans could be prepared and contracts awarded.

The base is located on an almost flat site, 3,960 acres in area, about 11 miles north of Minot in north-central

North Dakota. The initial construction contract in the amount of \$3,643,338.60, handled by Kiewit's Billings, Mont., office, includes grading and paving of the runway and the installation of jet-fuel storage facilities.

Subsequent contracts for work at the field have been awarded to Peter Kiewit Sons' Co., and Chicago Bridge & Iron Co., for the installation of roads and utilities. Another contract to Charles Harris Co., St. Paul, Minn., provides for the central heating plant and high-temperature hot-water heating system, and some of the buildings were prepared by W. F. Kurke & Asso-



New portable TENNANT machine . . .

removes traffic lines in 1 fast operation

For about 1¢ to 3¢ per foot . . . this machine provides a practical method of erasing old traffic lines. Does a complete job—without need for extra equipment, chemicals or large crews. Works up to 5 times faster than other methods. Easy handling makes it ideal for use on streets, highways, parking lots, airports, etc. Works during normal hours without tying up traffic.

Does permanent job without injury to pavement Machine has self-propelling action. Operator merely guides it over traffic lines. Cylindrical tool with scores of steel cutters revolves at 1450 rpm—smoothly shaves off paint in one operation. Covers path 4" wide; adjustable to cover path up to 7" wide.

- Works up to 5 times faster than other methods.
- Erases paint lines permanently; does not hurt surface.
- Portable . . . one-man operation . . . has self-propelling action.
- Works during normal hours without tying up traffic.
- May be used on concrete or asphalt.
- Covers path 4" wide; adjustable up to 7" width.

Write today for details.

G. H. TENNANT COMPANY
2534 N. 2nd Street, Minneapolis 11, Minn.



TRAFFIC LINE REMOVING MACHINE

SPECIALIZED MAINTENANCE EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 237

CONTRACTORS AND ENGINEERS

ciates, Fargo, N. Dak. Plans for additional buildings and utilities are being prepared by Henningson, Durham & Richardson, Omaha, Nebr. The base is being constructed under supervision of the Omaha District of the Corps of Engineers.

Takes big spread

Bids for this grading and paving job were taken on June 21, 1955, and just two weeks later, on July 7, the contractor was at work. While the first tractor-dozers to arrive at the site were busy clearing and grubbing the trees and stumps on the runway alignment, a large earthmoving fleet was assembling.

The first spread to start work con-

sisted of six scrapers, including Euclid, Cat DW20 and Cat DW21's. These were soon joined by six new Euclid scrapers. Another grading spread consisted of a Euclid loader and six 25-yard Euclid bottom-dump haul units. Working together, the two spreads moved some 400,000 cubic yards of material by mid-August.

Finishing operations followed immediately, six Caterpillar No. 12 motor graders handling the blading while the heavy clay soil was compacted by two Southwest 50-ton rubber-tire rollers pulled by Caterpillar DW21 tractors. Water, an important item in the compaction of the subgrade as well as in the subsequent

(Concluded on next page)



Finishing touches to the virtually completed subgrade are made by two Caterpillar No. 12 motor graders and two Cat DW21 scrapers. While the runway is in a cut, base and paving will bring the finished runway grade 6 feet higher than the subgrade.

C&E Staff Photo



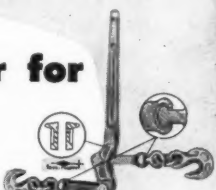
One of the rigs supplying water for subgrade compaction is this giant Euclid 10,000-gallon tanker. Equipped with a pump and high-level distributor at the rear, the unit spreads a curtain of water over a wide area as it moves along.

C&E Staff Photo

Here's the answer for
a safe load...

LEBUS LOAD BINDERS

Completely drop-forged
and heat treated



LEBUS LEBUS ROTARY TOOL WORKS, Inc.

P. O. BOX 2352 • LONGVIEW, TEXAS



LeBus Truckers
Snatch Block



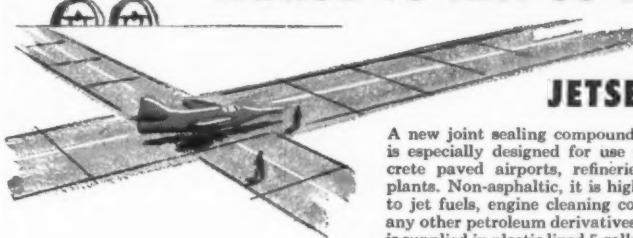
LeBus Tail
Chains

For more facts, use Reader-Reply Card opposite page 18 and circle No. 238

MARCH, 1956

1 2 3 4

New PAVING PRODUCTS Added to KAPCO Line!



JETSEAL

A new joint sealing compound, JETSEAL is especially designed for use around concrete paved airports, refineries and bulk plants. Non-asphaltic, it is highly resistant to jet fuels, engine cleaning compounds or any other petroleum derivatives. JETSEAL is supplied in plastic lined 5 gallon steel pails for ease of handling.

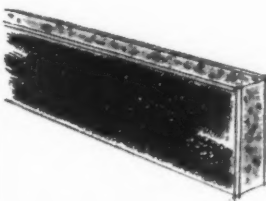
KAPSEAL

This new Keystone development is an amazing rubberized compound for sealing cracks and sawed joints in concrete or bituminous-resurfaced pavement. Kapseal Crack Filler is an ideal maintenance sealer and is easily applied with your present equipment. It will not become brittle and crack, offers excellent adhesion to all pavements and maintains absolute bond through cycles of expansion and contraction.



KAPCORK

KAPCORK is a non-extruding, premolded expansion joint developed for all highway and airport work. It consists of a composition of asphalt and new, granulated cork formed between asphalt saturated paper. KAPCORK features recovery of 80% of original thickness after compression, low moisture absorption, and ease of handling without breakage.



KAPCOLD JOINT SEALER

KAPCOLD JOINT SEALER is compounded from rubber and asphalt especially for sealing concrete joints. It is applied, under pressure, direct from the drum into joints and cracks without heating or mixing to form a positive bond that remains flexible at high and low temperatures assuring an effective seal through years of expansion and contraction.



Other KAPCO Products

include Fibre Expansion Joints, Premoulded Asphalt Expansion Joints, Tongue and Groove Joints, Concrete Curing Compounds, Rubber Asphalt Sealing Compound, Sewer Joint Compounds, and Mastic Board products.



Write for New Literature and Paving Products Catalog

KEYSTONE ASPHALT PRODUCTS COMPANY

Division of American-Marietta Company

American-Marietta Building, 101 East Ontario Street, Chicago 11, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 239

(Continued from preceding page)

base-laying steps, was supplied by three Ford T-700 tandem-axle trucks with 2,200-gallon tanks and a giant Euclid 10,000-gallon tanker. The big Euclid water wagon had a rear-mounted pump and a high-level distributor that spread a curtain of water over a large area as the rig moved along.

A large part of the completed subgrade was below the grade of the adjacent land, giving the impression of a huge shallow trench 150 feet wide, 1½ miles long, and ranging from a few inches to 5 feet in depth with practically vertical sides. But this appearance changed rapidly as the subbase and base course were added to fill the trench and make it rise above grade. The finished paving grade is actually 72 inches above the subgrade.

Base and pavement

The 6 feet of base and pavement is built up on the subgrade with five types of material. The first is a 4-inch layer of granular filter material. Next is a 38-inch course of selected borrow material called select subbase. The third course is a 20-inch lift of 35-CBR subbase material. A 6-inch course of 80-CBR base material completes the base. The final course of paving consists of a 4-inch layer of asphaltic concrete.

Materials for all of the base and subbase courses, as well as the aggregates for the hot-mix surfacing, were developed from local deposits on or near the base. Two Cedarapids crushing plants were set up to produce the required gradings. One of these was a Cedarapids Master Tandem plant and the other, a three-unit setup incorporating a jaw crusher and two roll crushers. Three Kohlman loaders, two with 42-inch belts and one with a 36-inch belt, loaded the materials into the haul units moving out to the runway.

Materials for the several courses of the base were laid down in varying lifts, watered and mixed to obtain optimum moisture content, and thoroughly compacted.

Personnel

General superintendent for the project was Nick Evans. Assisting him were Dick Millard, project engineer, and Jack Ratchye, office engineer. Superintendent for base and paving operations on the runway was Wally Johnson.

Lt. Col. T. W. Roe was area engineer for the entire project, which was built under the supervision of the Omaha District of the Corps of Engineers. He was assisted by a staff that includes Henry Ranspot, assistant area engineer; E. C. Wolters, chief of construction; W. J. Gremmels, office engineer; and J. O'Neil, soils engineer. Wolters took over as acting resident engineer at the start of the project to get the job underway while the other men on the staff were making arrangements to transfer to the new site.

THE END

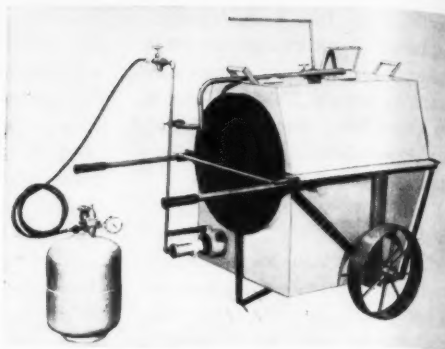
Don't forget—March is Red Cross month!

Portable barrel heater warms asphalt on job

■ A new portable barrel heater designed for on-the-job warming of liquid bituminous materials in their original shipping drum has been placed on the market by Tarrant Mfg. Co., 27 Jumel Place, Saratoga Springs, N. Y.

Fired by either bottled gas or kerosene, the Tarco heater can be loaded and operated by one man. Weighing 200 pounds, it is constructed entirely of sheet metal and iron parts and is equipped with wide-tread steel wheels for easy handling.

The new Tarco heater warms liquid materials in their original shipping drum.



A controlled flame and heat-diverting baffles apply heat evenly to the entire surface of either side or end-

bung barrels, thereby eliminating overheating and the hazard of flash fires. Side and end-bung agitators

A complete line of 5 "EUC" SCRAPERS to

more

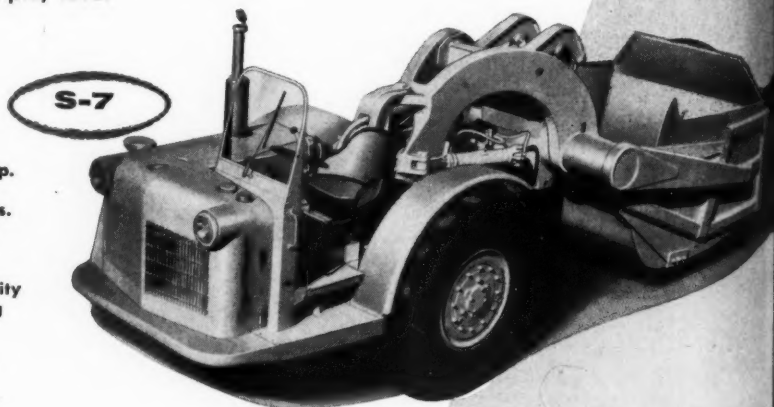
WORK-ABILITY...

Better

ACCESSIBILITY

Customer acceptance and preference has made "Euc" Scrapers the fastest selling line in the industry. The simple, practical design of every Euclid scraper model is years ahead of the field in ease of operation and maintenance and in production performance. Like all other Euclid earth moving equipment, "Euc" Scrapers are built to stay on the job longer with less down time for servicing and repair. For example, lever

action provides fast, positive and independent control of bowl, apron and ejector without cable or sheave expense. The 4 section cutting blade has long life and assures efficient loading in any material. All major components are readily accessible—a mighty important cost cutting feature—in both the single axle and four wheel tractor models.



The S-7 has better than 20 h.p. for each yard of payload—a 143 h.p. engine and 7 cu. yds. struck capacity. It's primarily designed for small yardage jobs and for work in close quarters where maneuverability is essential—non-stop turning width is 28 ft.—tires are 18.00 x 25 with 21.00 x 25 optional for work in sand or other tough job conditions.



For medium size jobs or as a utility machine on large projects, this S-12 is the answer. Payload capacity is 12 yds. struck and 16 yds. at 1:1 slope. Powered by a 218 h.p. engine, this model has a top speed of 28 mph with full payload—makes a non-stop 180° turn in 31 ft. Tires are 26.50 x 25—width of cut is 9' 6".

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

assure proper venting before heat is applied, and a temperature gage indicates when the liquids are hot enough to use.

For further information write to the company, or use the Request Card at page 18. Circle No. 103.

Davey names executive

L. W. Darling has been appointed assistant vice president of the Davey Compressor Co., Kent, Ohio, to direct the activities of 12 district offices and more than 150 factory distributors. He was formerly manager of government sales.

Electronic computer speeds earthmoving calculations

Electronic computers, which have shortened the time required to do long, complicated computations in many fields, are now being used to solve complex earthmoving problems.

Bendix Computer Division of Bendix Aviation Corp. recently programmed a sample earthmoving calculation and ran it on its G-15A general-purpose computer. The problem involved the total cut and fill requirements of a 3-mile highway strip with 230 cross sections. The "electronic

brain" arrived at the answer 20 to 30 times faster than it would normally have taken by manual figuring. The actual computation was done in only 46 minutes, including the time needed to prepare the data.

Now in full production, the G-15A promises to become one of the most valuable labor-saving machines for a contractor. Requiring no more space than two filing cabinets, the computer is expected in due time to take its place alongside other office machinery

that a progressive contractor uses to make his operations more efficient. The electronic machine, of course, far outstrips other calculators in the complexity and variety of the problems that it is able to handle.

The surprising time savings which the G-15A can achieve for the contractor are not confined to earthwork calculations. The computer can be used as a tool for such calculations as the analysis of origin and destination surveys, construction and maintenance costs, traffic accident reports, personnel statistics, road-life studies and road inventories, status of highways, and traffic flow and control with similar savings.

Operating the Bendix computer is considerably simpler than might be expected. For the problem described above, data pertaining to each cross section was typed on an electric typewriter connected to a paper tape punch. As the data is typed, it is entered as punched holes on an input tape that "feeds" the information into the machine during the actual computation.

For each particular type of problem, a "program" is required, that is, a list of instructions fed into the computer along with the figures. The program tells the machine what to do with the data to arrive at the answer. Once a "program" has been worked out for the first problem it will work for all problems of that type even though the data varies.

All succeeding problems of a given type after the first require only the time it takes to prepare data for use in the computer and the actual working time of the machine itself. In general, to prepare data for an earthmoving problem, it takes 1 to 1½ minutes per cross section. In the typical problem described above, which had some 230 cross sections to be dealt with, time spent to prepare input data was approximately five hours. The actual computer time is about 15 seconds per cross section, most of this representing type-out time. Manual figuring generally requires 30 to 45 minutes per cross section.

Bendix estimates that considering the expense of labor versus the expense of running a computer, operating costs are greatly in favor of using the computer. Cost savings are reported to be in excess of 15 to 1.

For further information write to Bendix Computer Division, Bendix Aviation Corp., 5630 Arbor Vitae St., Los Angeles 45, Calif., or use the Request Card at page 18. Circle No. 137.

Republic Rubber names

The Republic Rubber Division of Lee Rubber & Tire Corp., Youngstown, Ohio, has appointed Gordon Parks to the position of field representative. From headquarters in Denver, Colo., he will be responsible for the sale and service of Republic's line of hose, belting, packing, and molded and extruded products in the Rocky Mountain area.

For more facts, circle No. 240

ERS to 18 yds. struck payload • 143 to 518 h.p.

for a wide range of work—small jobs to big projects

15.5 yd.

S-18

With Torqmatic Drive and 300 h.p. engine, the S-18 hauls heaped loads up to 24 yds. at fast travel speeds—struck capacity is 18 yds. Standard tires are 27.00 x 33 with 33.50 x 33 optional for maximum traction and flotation on tough jobs. In spite of its size and capacity, the S-18 makes a non-stop 180° turn in only 36 ft.

The TS-18 is the most recent development in the Twin Power principle pioneered by Euclid. It is powered by two 218 h.p. engines—one in the tractor and one behind the scraper bowl. Both engines drive through separate Torqmatic Drives. Where even more power is required the tractor can be supplied with a 300 h.p. engine. It is a truly self-loading machine due to its tremendous power and traction—works on grades and under conditions that stymie other scrapers and is a one-man earthmoving outfit. Standard tires are 27.00 x 33—with 33.50 x 33 available as optional.

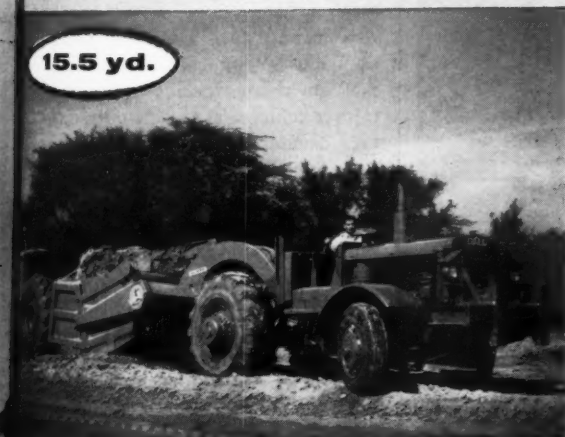
Twin-Power TS-18

For profitable scraper production and performance

Euclids are your best investment

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





Euclids wind around the mountain as they head back for another load. The big rigs had to climb grades up to 23 per cent to bring excavated material to the disposal area on the other side of the mountain.

Benches set back mountain for more than 2½ miles; 2,785,000-yard excavation is hauled over the crest

Benching job on high cliffs gives safety to roadway below

Movalls Dump All Materials — Here's Proof



MARINE CLAY—Dutcher Construction turned to Movalls when gravity-dump wagons couldn't discharge the glue-like clay on his Seaway job; found them ideal, ordered more. Clay came out of scrapers in wheel-blocking lumps. Dozer-type ejector with 140,000-lb. push wipes every load out clean, eliminates buildup. Dutcher frequently uses one load to bulldoze previous loads. He now has 12 Movalls (rated capacity 25 heaped yds., 31 tons) powered by Caterpillar DW21 turbocharged tractors.



FROZEN EARTH AND ROCK—C. A. Pitts, Ltd., operates eight C & D Movalls powered by Cat DW21 tractors on Seaway job near Prescott, Ontario. Movall bodies are built for extra heavy duty, take shock of 6-yd. bucket loads of rock and huge frozen chunks without damage. Big 11' x 19' target area and low 8' height make for easy spotting and fast loading by shovel, dragline or belt loader.



WET SAND, GRAVEL—RD15 Movall, for use with Cat DW15 and DW10 tractors, has rated capacity of 16 yds. or 22 tons. Here it's discharging heavy load of wet aggregate into grizzly at controlled rate. Exclusive scraper-in-reverse design enables Movall to dump either standing still or traveling; operator controls action through standard Caterpillar controls.



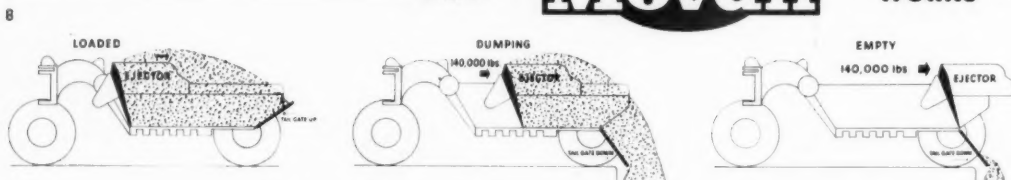
ROCK—Berlanti Construction Co., owns 5 Movalls, says, "Positive ejection enables Movall to handle rock, dirt, or sticky materials. Also we find it very adaptable when interchanging from Movall to scraper operation." Interchangeable yoke speeds changeover, permits Movalls to work behind several different prime movers.

SEE FOR YOURSELF. Ask your Caterpillar-C & D dealer **NOW** for a buy-and-try demonstration... or write C & D Division, Yuba Manufacturing Company, Perkins (suburb of Sacramento), Calif. Phone: GLadstone 5-8592.

HOW

**C & D
Movall**

WORKS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 241

Making a mountain out of a mole hill is a lot easier than making a mole hill out of a mountain. At least that's the conclusion of Nello L. Teer Co., Durham, N. C., which is getting ready to get a benching job at Aliquippa, Pa., in full swing again now that winter is practically over.

The 800-foot-high cliffs at Aliquippa run along a secondary road that parallels the east bank of the Ohio River. The possibility of land slides endangered the road, but it was not until 1949, when a rock slide hit a bus and killed 23 passengers, that an aroused citizen's committee from Aliquippa and South Heights, Pa., demanded that something be done to make the road safe.

Teer's job, involving the excavation of 2,785,000 cubic yards of material—about 80 per cent of it rock and shale—was started last year and scheduled for completion within two years. When the mountain is set back in benches for a length of 2.53 miles, the highway running at the base of the cliffs will be widened. The number of benches will run from one to six, depending on the height of the slope.

Material hauled over crest

Blast holes are being put down by a Mayhew rotary drill, which has a Roto-Clone dust reflector that blows earth and ground rock into the air and away from workers. The Atlas explosive used is planted deep enough so that only a slight heave in the earth indicates there has been an explosion.

Two 4½-yard shovels—one of them a Marion 111-M—a 2½-yard shovel and 20 Euclid rear-dump trucks move in as soon as the blast has gone off. The Euclids, most of them equipped with General giant tires, have to take their loads of earth, rock, and shale up and over the mountain, going up grades as steep as 23 per cent in the average ½-mile haul. Working 6 days a week, under the direction of general superintendent Robert E. Tidwell, this spread of equipment is averaging a total of 7,500 cubic yards of excavation per 10-hour day.

As the wide steps are being cut in the mountain, asphalt-coated, cor-

CONTRACTORS AND ENGINEERS



At the highest point of the job, above the mills of Jones-Laughlin Co., and the Ohio River, a Marion 111-M crane loads blasted earth, rock, and shale to a Euclid end-dump. The crane has accounted for up to 385 loads of material daily.

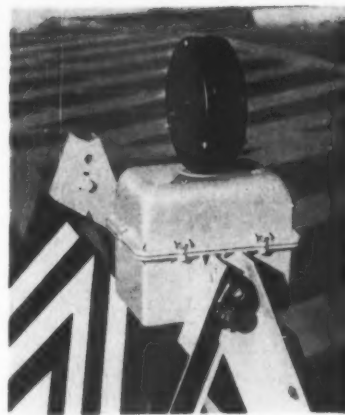
Neon warning light

■ A new two-way flasher light for warning motorists or pedestrians of road and street obstructions, construction projects, and other safety hazards has been introduced by the Gen-A-Matic Corp.

Approximately 7×5×8 inches in size, the Gen-A-Matic light uses a new neon tube said to offer greater visibility than conventional lights. It has a non-fading, shatterproof Stimsonite lucite optical lens.

Battery drain is at a minimum despite increased intensity of the light and, according to the manufacturer, 6-volt batteries will last from two to three months on the unit under continuous operation.

For further information write to



Gen-A-Matic Corporation, 14741 Bessemer Street, Van Nuys, California, or use the Request Card at page 18. Circle No. 156.

rugated metal pipe is being installed for vertical slope drainage.

Safety important

Despite the use of dynamite and heavy equipment on the steep grades and high ridges, there has been no serious accident on the job. This highway at the base of the cliff is being kept open to traffic during the operations, and here too, strict safety practices have kept danger to a minimum. Whenever blasting is scheduled, or wherever there is any other danger to the road below, Teer patrolmen are alerted by walkie-talkies to halt traffic until the road is absolutely safe.

THE END

Construction bodies

■ A new series of construction bodies for trucks designed for mounting drills and other equipment, and for carrying tools and crews of as many as 7 men are featured in a bulletin from J. H. Holan Corp. Body dimensions, diagrams, accessories, and specifications of the Series 7000 C are included.

To obtain this bulletin write to J. H. Holan Corp., 4100 W. 150 St., Cleveland 11, Ohio, or use the Request Card at page 18. Circle No. 65.

Handling explosives

■ A revised list of instructions on the proper handling and use of explosives and blasting supplies, recently approved by the Institute of Explosives Makers, is now available from Atlas Powder Co. The bulletin lists 72 do's and don'ts to be observed while transporting, storing, handling, loading, and tamping explosives, and when shooting either electrically or with cap and fuse.

Suggestions for underground work, for actions to be taken after firing, for explosives disposal, and for minimizing poisonous-gas hazards after blasting are included. Approved methods for priming an explosive cartridge with cap and fuse and electric blasting caps are described and illustrated.

To obtain this bulletin write to Technical Division, Atlas Powder Co., Concord Pike and New Murphy Road, Wilmington 99, Del., or use the Request Card at page 18. Circle No. 162.



DEWATERING COFFERDAM BELOW CUT-OFF POINT of timber piles for Wilmington River bridge piers on US 80, outside Savannah, Ga. After piles were driven to refusal, 8' concrete tremie seal was poured. These two Jaeger 4" pumps then unwatered cofferdam again for placement of 4' reinforced concrete distribution block. Bridge has 14 of these twin-shaft piers. McMeekin Construction Co., Cheraw, S. C.



IN EXCAVATION for new Southdale Shopping Center, near Minneapolis, Minn., Johnson, Drake & Piper used this Jaeger 3P to pump inflow from spring into sewer line.



24-HOUR-A-DAY PUMPING for approximately 9 months each year for the past 3 years, demonstrates the dependability of this pair of Jaeger 6" Sure-Prime Pumps. Aughenbaugh Coal Co. strip mine, Curwansville, Pa.



DIESEL POWERED 6" PUMPS deliver rated 90,000 gph at efficient diesel engine speed of 1450 rpm. Ideal for continuous pumping of long ditches draining sand below Lake Erie water level for Erie, Pa., sewage disposal plant addition. Rust Engineering Co., Pittsburgh, Pa.

They bet their shirts on Jaeger Pumps

There are good reasons why such a high percentage of experienced contractors use Jaeger Sure-Prime pumps on their work. Size for size, your Jaeger Sure-Prime has a larger shell and impeller so that it holds more priming water and is subject to less concentrated wear. Its engine is of

the highest horsepower applicable. You gain the advantage of two independent, simultaneous priming actions for fast, sure priming, and you prime and pump at slower, longer-life engine speeds. Some pumps run at 2000 rpm to do what a Jaeger does at 1400. This high efficiency is maintained by posi-

tively lubricated "Lubri-Seal" — the only pump seal that is provided with a ready-inspection port.

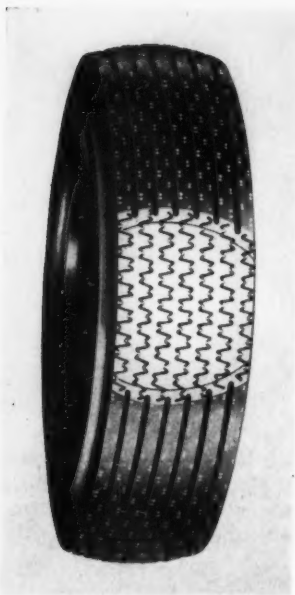
For 4000 to 240,000 gph capacities — or pressures to 275 psi — there's a Jaeger pump built to do your job. See your Jaeger distributor, or send for Catalog P4.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

COMPRESSORS • MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 242



Retreading wire improves tire traction

■ A new retreading wire for tires is designed to give greater tire protection, increased traction, and allows more treads per carcass, according to the manufacturer, Harold E. Kimes Corp. The wire's spring steel grippers, arranged in a wedge-like pattern in the tire, bite deep into the road surface as traction or braking is applied.

Wire loading and abutting tools, made available by the manufacturer, are all that are required for installing the retreading wires in tires. Special jigs and fixtures are unnecessary.

It is claimed that tires equipped with the wire will stop faster in any kind of weather, and the wire guards against cuts and bruises. Because heat is conducted through the wire directly to the road surface, tires are said to run much cooler.

For further information write to Harold E. Kimes Corp., Rockford, Ill., or use the Request Card at page 18. Circle No. 97.

Book on highway noise

Three papers discussing methods of detecting and evaluating noise factors on highways and the means of eliminating that noise are contained in HRB Bulletin 110, "Abatement of Highway Noise and Fumes." Also reported are preliminary studies on the problem of eliminating toxic gases and exhaust fumes.

The first paper, "Abatement of Highway Noise with Special Reference to Roadside Design," by Wilbur H. Simonson, reports the results of highway-noise studies of the past several years. The second paper, "Motor Vehicle Noise Studies," by D. M. Finch, explains the characteristics of noise and describes tests made on heavy-traffic routes in California.

"Second Report of Special Task Committee on Roadside Design to Reduce Traffic Noise, Dust, and Fumes," also by Simonson, emphasizes the need of reducing the noise at its source through the application of tests and controls on vehicles.

Priced at 90 cents, the book is available from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

THIS MARION TRUCK CRANE Model 43-MR is rated to handle a 35-ton load at a 15-foot radius with a 40-foot boom and outriggers. Dual front axles give the unit good weight distribution characteristics. The 43-MR, built on a 180-inch wheelbase, can turn in a 45-foot radius. For further information write to the Marion Power Shovel Co., Cheney Ave., Marion, Ohio, or use the Request Card at page 18. Circle No. 147.



F-100 8-ft. Pickup—GVW 5,000 lbs.

T-800—GVW 42,000 lbs.; GCW 65,000 lbs.

Ford saves you money with

YOU SAVE ON PARTS REPLACEMENTS—add miles to engine life!

YOU SAVE ON SHOP LABOR—cut maintenance to the bone!

YOU SAVE ON YOUR ORIGINAL INVESTMENT—get more work done per truck!

Ford Trucks for '56 save you money right from the start. And, they keep on saving with their extra-sturdy, long-life engine design.

For instance . . . Ford Engineers have now introduced into all heavy-duty engines the greatest valve advancements ever. As an example, see the exhaust valve in diagram on right page. The valve stem is hollow and partially filled with powdered sodium. When the sodium gets hot, it turns into a liquid. As it moves up and down, it carries heat away from valve head—allows it to operate up to 225° cooler! Result: a cleaner-running, more burn-free, longer-lived valve face.

Ford's long-lasting engine design pays for you in every way. You save money on parts replacements such as piston rings and bearings. You save on shop labor—extra time between preventive maintenance jobs like valve adjustments, valve grindings, compression tests, ring jobs and the like.

And you can save on driver costs if you can keep trucks out of the shop and on the road. Yes, you save in every way when you get more work done per truck!

There's a Ford Truck for every trucking job. Before you buy your next truck, Test Drive a Ford Economy Truck.

FORD TRUCKS LAST LONGER

Certified by independent insurance actuaries for the ninth consecutive year! Studies of over 10,068,600 current license registrations show that Ford Trucks last up to 9.9% longer than any of the other 4 leading truck makes!

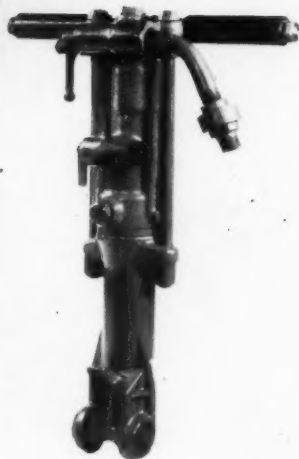
CONTRACTORS AND ENGINEERS

New rock drill features positive locking action

■ The new Model 77 Thor air-operated rock drill now in production features a latch-type front head which assures a positive lock when pulling drill steels mounted on a sinker leg.

Like the older Model 75, the new rock drill weighs 55 pounds and is designed for drilling holes up to 20 feet deep in hard rock. A heavy-duty drill, the unit can also be used for shaft sinking, quarrying, roadbuilding, and other rock-removal jobs where footage is important.

For further information write to the Thor Power Tool Co., Aurora, Ill., or use the Request Card at page 18. Circle No. 105.



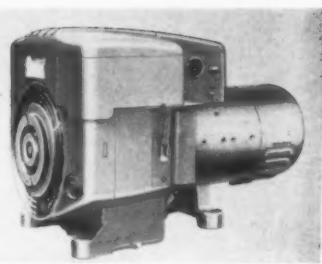
The new Thor Model 77 air-operated rock drill.

Air-cooled electric plants

■ Two new electric generating plants, in 3,500 and 5,000-watt ac sizes, are announced by D. W. Onan & Sons, Inc., University Ave. S.E., Minneapolis, Minn. Models 305CCK and 5CCK are each powered by a 2-cylinder gasoline engine.

Both of these two generating plant series are available in 60 or 50-cycle; 115, 230, or 115/230-volt, single phase, and 230-volt, 3-phase, 3-wire. There is a choice of standard, remote control, portable, or manual starting models. Fuel consumption for Model 305CCK is reported to be 0.19 gallon per kilowatt hour at full-rated load.

The generators are directly connected to the engines for permanent alignment. Model 305CCK, a remote-



starting unit, is 26 $\frac{3}{8}$ inches long, 21 $\frac{1}{8}$ inches wide, and 20 $\frac{3}{4}$ inches high. Model 5CCK is 29 $\frac{3}{8}$ inches long but is otherwise the same size as the 305CCK.

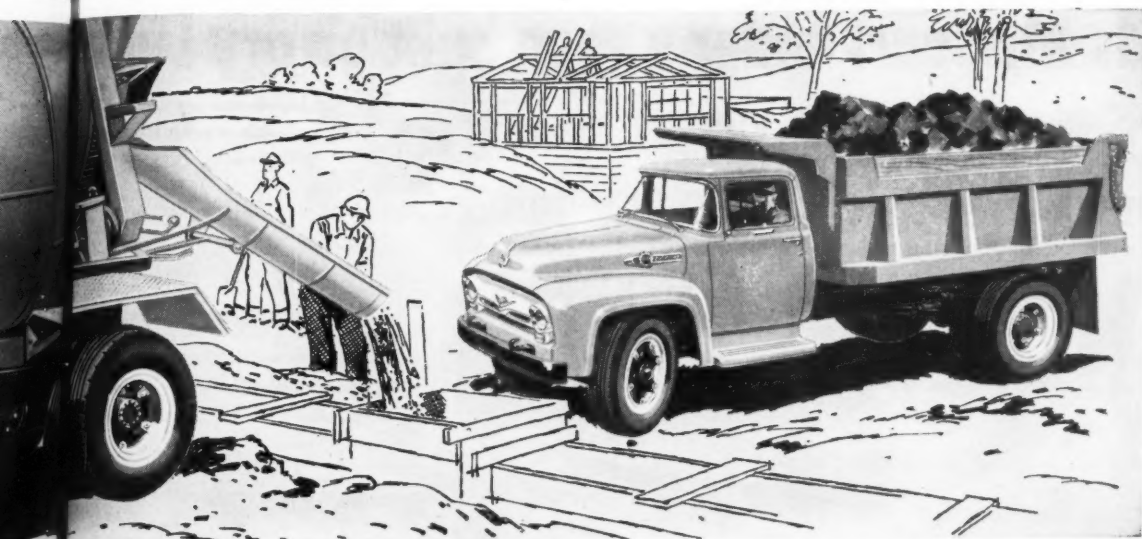
For further information write to the company, or use the Request Card at page 18. Circle No. 142.

Booklet on wire rope splicing and fitting

■ Detailed information on splicing and fitting wire rope is presented in a new booklet from E. H. Edwards Co., Butler Road and Industrial Way, South San Francisco, Calif. Sections cover making a tuck, breaking down a strand, blocking and serving, marine eye splice, logger's eye splice, rolled-in eye splice, and endless splice.

Also included are sections on eight-strand ropes, variants and lengths of ropes, grommets, attaching a socket, socketing a ferrule, brazing and tapering, cutting, seizing, clips, thimbles, and end fittings. Step by step photographs and drawings illustrate correct methods of splicing and fitting.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 161.



F-900—GVW 29,000 lbs.; GCW 60,000 lbs.

with new long-life engine design

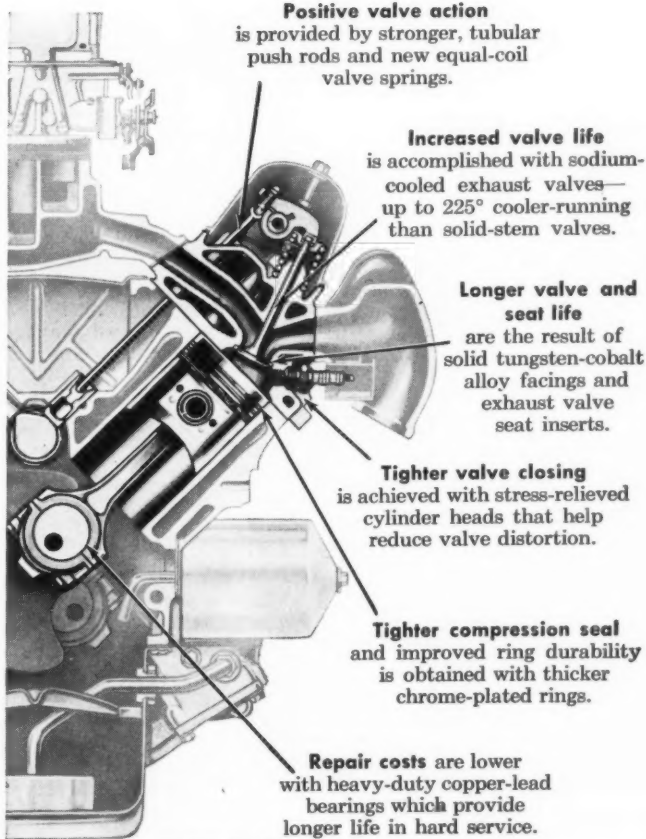
Hauls up to 3000 lbs. more than other 6-wheelers—New Ford T-800

New power and hauling capacity of the Ford Tandem Big Job cuts hauling time on every run—makes giant cargos seem lightweight. You have a choice of two gas-saving Ford Stroke engines. Either the 190-h.p. Torque King V-8 or, the 200-h.p. Torque King Special V-8.

You have new engine advancements for longer life (some explained and illustrated on the right).

New high-capacity tubeless tires, heavy-duty 5-speed transmission and Power Steering are standard equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-power brakes are available at low extra cost.

New Driverized Cabs for driving comfort and convenience have Lifeguard Design safety features found in no other truck. Lifeguard steering wheel helps protect driver from steering column; Lifeguard door latches help keep doors from jarring open in case of accident.



Positive valve action is provided by stronger, tubular push rods and new equal-coil valve springs.

Increased valve life is accomplished with sodium-cooled exhaust valves—up to 225° cooler-running than solid-stem valves.

Longer valve and seat life are the result of solid tungsten-cobalt alloy facings and exhaust valve seat inserts.

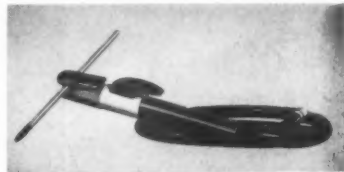
Tighter valve closing is achieved with stress-relieved cylinder heads that help reduce valve distortion.

Tighter compression seal and improved ring durability is obtained with thicker chrome-plated rings.

Repair costs are lower with heavy-duty copper-lead bearings which provide longer life in hard service.

Heavy-duty torch features molded jaw insulators

■ The new Arcair Model G-5 cutting and gouging torch designed for heavy-duty work and long service life features impact-resistant molded jaw insulators and a silicone glass laminate sleeve to protect the upper end of the handle from the heat. Delivering almost twice as much air as the



The Arcair Model G-5 torch.

Model G-3 it replaces, the new torch will take up to $\frac{3}{8}$ -inch diameter electrodes.

The unit operates from a dc welding machine and a compressed-air line. Rotating nozzles permit the electrode angle to be changed. The depth of the cut and the amount of metal removed can be controlled by the operator.

Grooves left by the torch are clean and ready to weld without further preparation, according to the manufacturer.

For further information write to the Arcair Co., 423 Mt. Pleasant Ave., Lancaster, Ohio, or use the Request Card at page 18. Circle No. 106.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 243



A single shot blows a gap in the narrow strip of land separating the river and the new pilot canal leading to the old riverbed. At this time the river was at its lowest stage.

U. S. Army Corps of Engineers Photo



As water starts flowing through the pilot channel, this 12-inch sand dredge widens the entrance to the channel. The hydraulic dredge, with no cutter or spuds, has a suction line with a vertical leg projecting into the water.

C&E Staff Photo

Diversion job leads Missouri under a span built on dry land

Dredged pilot channel leads stream back to old bed; pile and rock revetments confine flow of the waters

There is usually nothing to be done about "water under the bridge". But at Decatur, Nebr., where a much publicized \$2 million bridge spanned a wide expanse of dry river bottom and its east approach ended in the Missouri River, the U. S. Army Corps of Engineers did do something about getting water under the bridge.

Originally, the Missouri River ran on the dry bed, adjacent to the Nebraska shore, as it would past Decatur. But in 1946 the restless stream broke out of its channel and shifted to a new location about a third of a mile to the east. Fully expecting the river to return to its original course, the Burt County Bridge Commission built the span over the dry channel in 1950, taking advantage of the economies afforded by dry-land construction. But the river did not return to its original course, and the problem of diverting the river back to its old channel was taken to Washington.

Perhaps the best-founded opposition to such a project came from the Corps of Engineers. Maj. Gen. Samuel

D. Sturgis, Jr., Chief of Engineers, made it clear to Congress and to the public that the Corps did not favor a piecemeal channelization job in the Decatur area. The Missouri River stabilization program had been carried systematically upstream to the Omaha area, he pointed out, and jumping the program 60 miles upstream to Decatur would be extremely hazardous unless continued funds were made available to anchor this element of the system into a tie-in bluff some 16 miles upstream.

Congress balked for a few years, but in 1954, it appropriated \$2 million to start the project. The Omaha District of the Corps of Engineers immediately started construction, trusting that Congress would make continuing appropriations in future sessions so the work could be incorporated safely into the permanent river stabilization plan.

Pile and rock revetments

Cunningham-Kiewit Co., Omaha, and Connor-Stavely Construction Co.,

Kansas City, Mo., were awarded the first contracts for the construction of pile pikes and riprap to stabilize the east bank of the river from the bridge site to more than a mile and a half upstream. These revetments were to

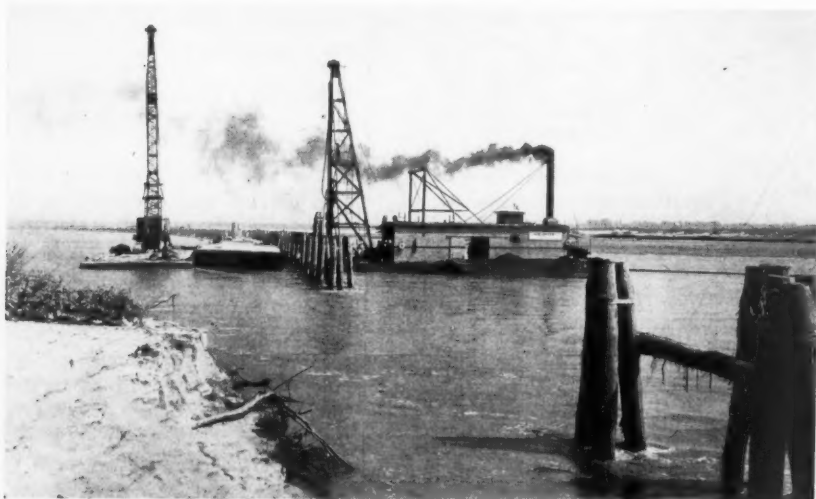
guide the river back under the bridge when the detouring channel was plugged.

When this work had progressed substantially, another contract was awarded to Missouri Valley Dredging



While the 12-inch dredge works in the background, this Bucyrus-Erie 45-B assists in widening the channel entrance by cutting into a point of land with a Page 2-yard bucket.

C&E Staff Photo



With the river flow divided between the new pilot channel and the established stream bed, work on the dike is rushed to completion. The dike will tie into the piles at right, on the newly established riverbank.

C&E Staff Photo



Rock barged to the dike is pushed into the water by an International TD-14A tractor with a Bucyrus-Erie angled dozer. As rock nears the surface, a crane will take over the job of placing rock.

C&E Staff Photo

CONTRACTORS AND ENGINEERS

Co., Inc., Omaha, for the dredging of 10,000 linear feet of pilot channel to guide the river under the bridge when the upstream closure was made. The two contractors on the initial phases of the work made such exceptionally good progress that the project was brought to the closure stage almost a year ahead of the originally planned schedule.

This timing gave the job an unexpected advantage, for the time of closure of the channel and diversion of the river coincided with the closure of the Gavins Point Dam some 110 miles upstream. At this time, the flow in the Missouri was reduced to an all-time low for several days as Gavins Point Dam was closed and the pool filled to the level of the spillway gates.

At the point of low flow on August 1, 1955, the plug of earth at the entrance to the pilot channel at Decatur was blasted out, and water started flowing through the pilot channel and under the bridge. At the same time, the closure dike across the channel that the river had made in 1946 was rushed to completion that almost the entire flow of the river was diverted through the new channel. As the river flow increased, the natural scour widened and deepened the channel until in a few weeks the river looked like its old self at Decatur.

Dredging pilot channel

Behind this successful job of moving the river was months of hard work by both contractors. Even getting Missouri Valley Dredging Co. equipment to the location of the pilot channel was a job. The firm first had to cut a canal about 2,000 feet across the bottomland from the river to about the midpoint of the pilot channel. In May, 1955, four dredges were brought in through this canal, and two of them started working in each direction to make the first cut of the channel.

One of these machines, the dredge No. 104, was a 12-inch cutter-head suction dredge. The other three were 12 and 10-inch plain suction dredges without cutters. The 104, built on a 30x84-foot hull, had a 300-hp Murphy diesel engine driving its pump at 450 rpm. Another Murphy diesel rated at 165 horsepower was connected to a GM generator that supplied power for the cutter and auxiliaries. An American 5-drum hoist driven by a Ford industrial engine operated the swing and hoist lines and controlled the 12-inch-square steel spuds.

The 14-inch suction line fed the pump, which discharged to a 12-inch floating discharge line. This line, 400 feet long, was equipped with ball-and-socket joints. Land lines of plain steel pipe were moved from one position to the next by a Caterpillar D6 tractor equipped with a sideboom.

The two 12-inch suction dredges were powered by GM twin 6-71 diesel engines. The 10-inch dredge was powered by a Murphy diesel. These three dredges had Clyde 3-drum hoists, powered by gasoline engines, operating the swing and hoist lines. Not equipped with spuds, they maneuvered

(Continued on next page)

The Koehring 605 first works with an Esco orange-peel bucket to clean logs and debris out of the dike. With this done, it will finish transferring rock from the barge to the new dike.

C&E Staff Photo

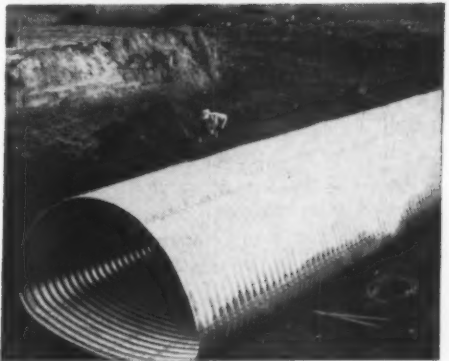
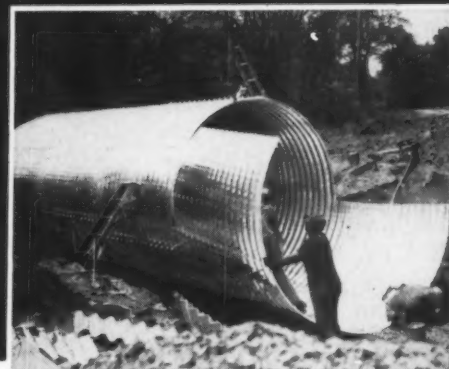


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AMBRIDGE Sectional Plates are furnished to accommodate any shape or size of pipe, arch, or pipe-arch complete with bolts. Special details, such as asphalt coating, hook bolts, beveled ends, and skewed ends, are furnished as specified for each job.

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AMBRIDGE Sectional PLATES

UNITED STATES STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 244

(Continued from preceding page)

vered entirely by their anchor lines. Each had a Kohler light plant to generate power for needed lights and incidental uses.

The first cut in the 10,000-foot pilot channel, 80 feet wide and to a depth of 12 feet below construction reference plane, removed 757,000 cubic yards of material from the river bottom. In subsequent widening of the channel, an additional 937,710 cubic yards was removed. The land lines of the hydraulic dredges carried the material out of the river channel and deposited it behind the pile and riprap revetments which had already been prepared.

Although most of the excavation was in sand, which was well suited for the hydraulic dredges, there were some tough spots near the downstream end of the channel. Here, where the material was a mixture of sand, muck, and water, together with logs and other debris deposited by the river, the ground was too soft to support tractors and too marshy to permit boats to operate. To move the anchors for the dredge swing lines, workmen had to plow knee or waist-deep through muck, dragging the cables with them. The buried logs and other debris also made trouble for the dredges.

Plug is blasted

By August 1, most of the initial cut had been completed, and only a small plug of earth separated the pilot channel from the river at the upstream end. Since the river was at about its lowest stage—the closure of Gavins Point Dam having been done two days before—Corps of Engineers' crews planted a heavy charge of dynamite in the plug and blasted it out in a single shot.

Although some water started flowing through the pilot channel immediately, there was still a good deal of dredging to be done before the mouth of the channel was completely opened. One of the 12-inch suction dredges moved to the channel mouth and began widening and deepening the entrance, and a Bucyrus-Erie 45-B dragline with a Page 2-yard drag bucket helped remove the last of the plug and open the mouth of the channel.

In the meantime, the Cunningham-Kiewit crew drove piles and placed riprap at full speed to close the detour channel of the river and forced the entire flow through the pilot channel. This project had actually started about a mile and a half above the bridge in order to guide the river toward the pilot channel. Most of this 8,500-foot pile revetment consisted of a double row of pile clumps, spaced 15 feet apart and tied together with longitudinal piles.

The section of the revetment closing the river channel consisted of three rows of clumps spaced at 18 feet and tied with two rows of longitudinal piles. All clumps consisted of three untreated cypress or southern pine piles averaging about 50 feet in length. Rock riprap was dumped against the upstream side of the pile dike to make the closure. In time, the material car-

ried by the river is expected to deposit and completely close the dike.

Pile dike closes channel

The driving of the 4,000 piles in the revetment was done by a steam-powered, floating, pile-driving rig with stationary leads. Driving operations were handled by a Clyde 3-drum hoist, while the anchor lines were controlled by two American hoists. All were steam driven. A Worthington jet pump provided water at high pressure to start the piles down, and a Vulcan single-acting steam hammer in the stationary leads put them home.

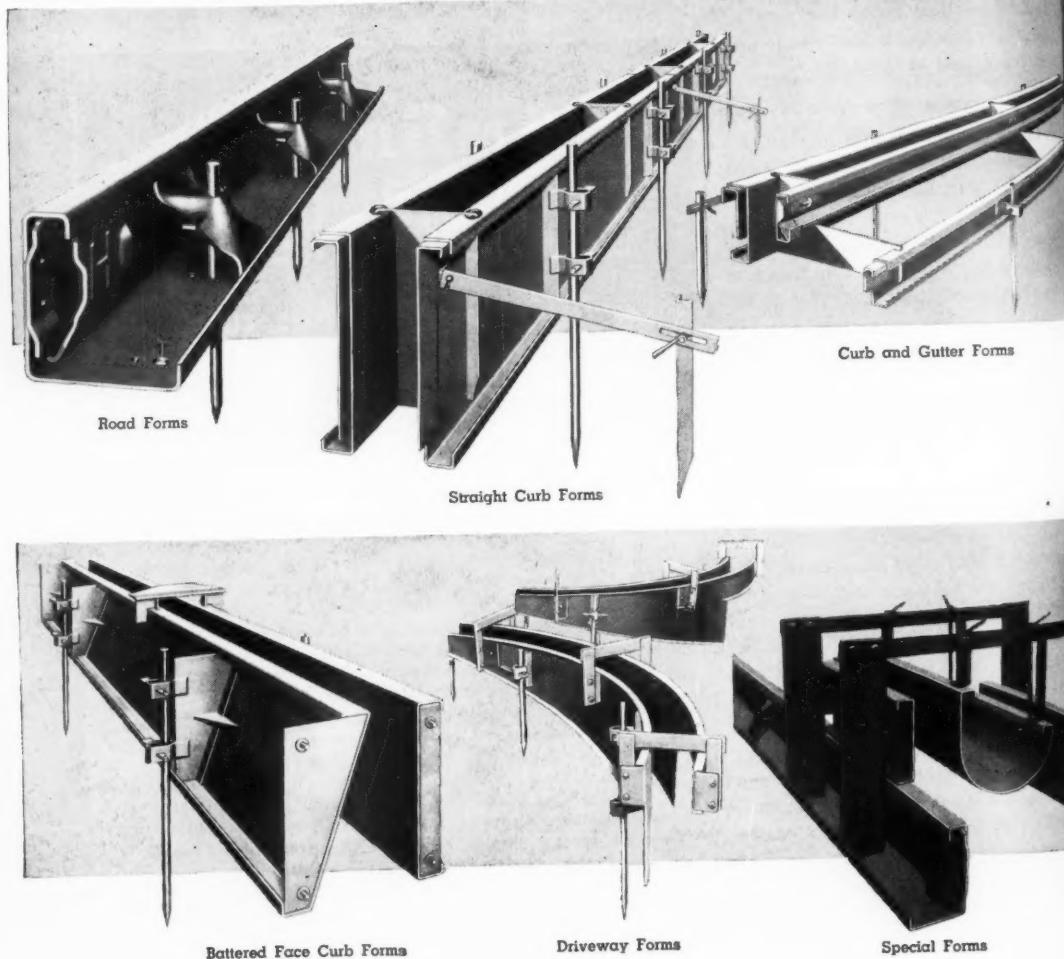
When piles had been rafted to the driver by a tug, they were stored in quiet water behind the completed portions of the dike. A small towboat

This pile-driving rig, using stationary leads carrying a Vulcan single-acting steam hammer, drives the untreated cypress and southern pine piles, averaging about 50 feet in length, into about 20 feet of water at this point.

C&E Staff Photo



Form Engineering



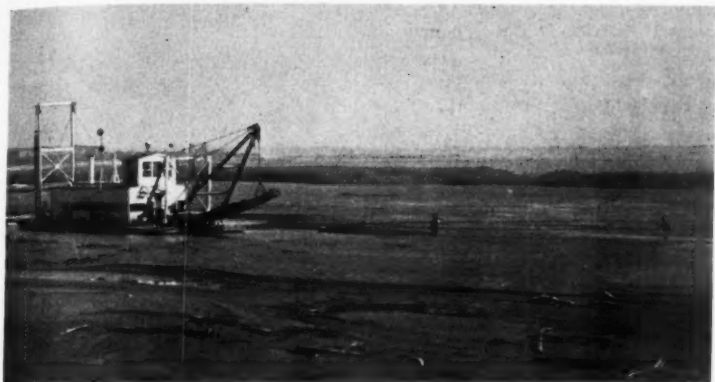
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CONTRACTORS AND ENGINEERS

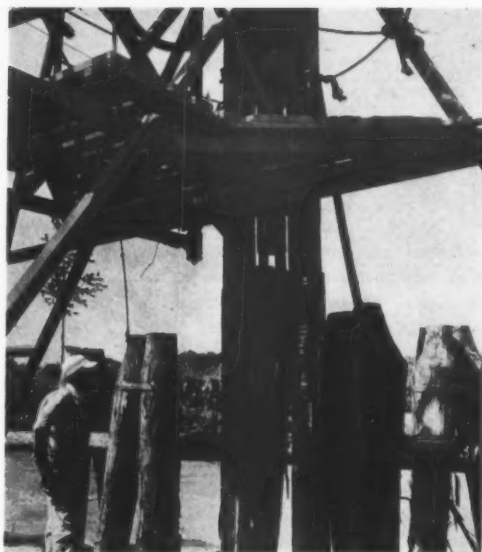


At the downstream end of the pilot channel, workmen waded almost waist deep through muck as they pull the swing lines of the dredge 104 ahead. Four dredges removed 757,000 yards of material in the first cut for the 10,000-foot channel.

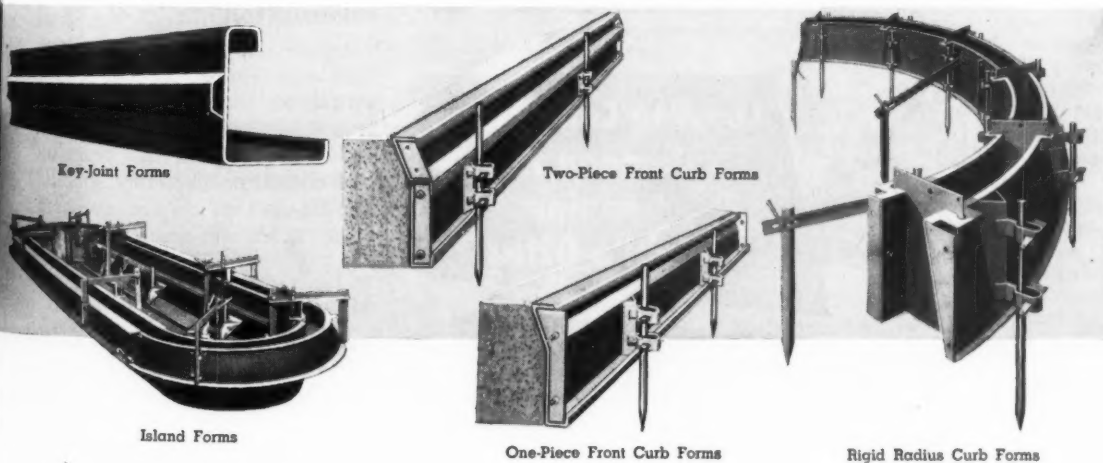
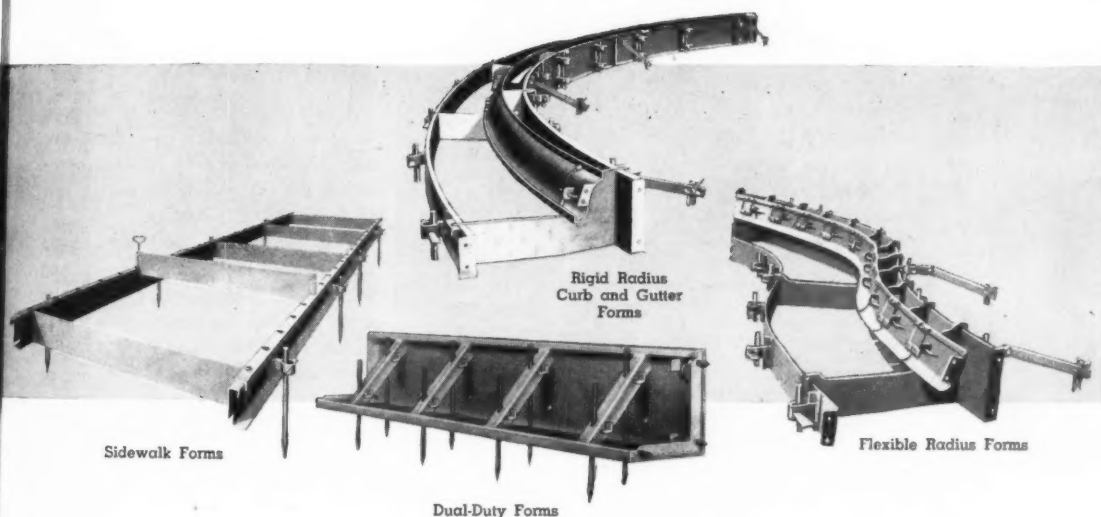
C&E Staff Photo

Pile-driver foreman M. K. McClellan sees one of the piles driven home by the Vulcan hammer. Each group of three piles is drawn together in a clump and wrapped with $\frac{3}{8}$ -inch galvanized cable. Each wrap of the cable is spiked to each the piles.

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shuttled the piles from the raft to the driver as they were needed. The three piles spaced 5 feet apart in each clump were driven to form a triangle.

After the piles had been jetted and driven to proper grade, the heavy ropes passed around the clump were tightened by a winch so that the tops of the piles were pulled tightly together. Seven rounds of $\frac{3}{8}$ -inch galvanized cable, wrapped about 2 feet from the tops of the piles, were pulled tight around the clump. Each strand of the cable was tightened independently by the Clyde hoist, then secured to each pile by a long spike, which was driven into the pile and bent over the cable.

Longitudinal piles were inserted between the rows of clumps and securely lashed to each clump. This was done by three turns of the $\frac{3}{8}$ -inch cable, tightened and spiked in the same manner. In the two-row dikes, the clumps were staggered. In the three-row dikes across the river channel, the clumps in the first and third rows were opposite, while those in the second or middle row were staggered. Across the river channel, where the water ranged up to 20 feet in depth, piling as long as 55 feet was driven.

Just behind the pile-driving crew were the rigs placing the rock riprap. Rock from a nearby quarry was delivered by trucks that used a specially prepared ramp to back onto the barges and dumped their loads. The barges, each loaded with approximately 180 tons of rock, were pushed to the placement site by towboats.

When a barge tied up beside the pile dike, an International TD-14A tractor with a Bucyrus-Erie angle-dozer started a section of rock fill by pushing the rock off the flat deck of the barge against the pile dike. Working the tractor carefully with the blade set at an angle, the operator was able to unload the entire barge. As the rock level neared the water surface, the barge was forced away from the piles so that the dozer could no longer place the rock.

At this point a barge-mounted Koehring 605 crane took over, using an Esco orange-peel bucket efficiently as it removed logs and other floating debris the river had deposited in the dike. Then the crane bucketed rock from a barge to build the riprap up

to proper grade. The crane also carried a Sauerman drag-bucket and an Omaha dragline bucket for use whenever needed.

As the pile and rock revetment was carried across the channel, the flow of the river was gradually forced into the old pilot channel and then under the bridge. The pile dike was carried across the channel to tie into a pile, and rock revetment continued downstream to the bridge, completing the re-establishment of the east bank of the channel at its pre-1946 location.

With the diversion project complete, the bridge commission went ahead with plans to finish the east approaches to the bridge. Ceremonies marking the opening of the bridge between Decatur, Nebr., and Onawa,

Iowa, are set for May 3, 4, and 5.

Personnel

Supervision of the excavation of the pilot channel was handled by Charles E. Hobbs, superintendent for Missouri Valley Dredging Co. R. L. Corwine was general superintendent for Cunningham-Kiewit on the pile and rock revetment work. M. K. McClellan was pile-driving foreman.

Supervision of the project for the Omaha District of the U. S. Army Corps of Engineers was handled through the Nebraska City Area Office through August 1, 1955, under John V. Stapp, area engineer. After that date, the Onawa Area Office, headed by R. R. Walton, supervised the work. The project engineer on the job for the Onawa Area was Edward

O'Rourke. District Engineer of the Omaha District is Col. Thomas J. Hayes.

THE END

Four-wheel-drive units

■ Napco four-wheel-drive units for use with GMC and Chevrolet trucks are described in a folder from the firm. With a two-speed transfer case, Powr-Pak units offer eight speeds forward and two in reverse. Trucks equipped with the Powr-Pak 4-wheel unit are shown. Full specifications are given. The literature is printed in English and Spanish.

To obtain this folder write to Napco Industries, Inc., 834 N. 7 St., Minneapolis 11, Minn., or use the Request Card at page 18. Circle No. 115.



Newly designed saw table for portable electric saws

■ A new heavy-duty saw table made by The Black & Decker Mfg. Co. will convert any of their portable electric saws from the 6 to 8-inch sizes to the equivalent of a tilting-arbor bench saw in a few minutes. The top dimension of the table is 22 1/4 x 22 1/4 inches. The front of the adjustable blade is able to handle boards up to 12 inches wide. Equipment includes an adjustable mitre gage and a rip fence that extends the full length of the table top.

A plastic safety shield is designed to protect operator's eyes from saw dust particles, and an original knee-action cut-off switch allows the saw to be turned off instantly.

The aluminum-top steel-legged table stands 32 1/2 inches high, and weighs 44 pounds. The maximum depth of bevel cut ranges from 2 3/32 inches at 90 degrees to 1 13/16 inches when the saw is tilted to a 45 degree angle.

For further information write to The Black & Decker Mfg. Co., Joppa Road, Towson 4, Md., or use the Request Card at page 18. Circle No. 76.

N. Y. Thruway authority releases toll statistics

Regular toll revenue on the New York State Thruway in 1955 totaled \$12,732,834, with 14,287,393 vehicle trips being made. The authority also collected \$810,027 in tolls from its Grand Island Bridges between Buffalo and Niagara Falls and also sold 40,212 of its \$20 annual permits.

New text on construction

A new volume in the Civil Engineering Series has been published by the McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. Entitled "Construction Planning, Equipment, and Methods", the book aims at providing material about construction to engineering and architecture students and to practicing engineers.

Full treatment is given to the various stages of construction, keeping records of equipment performance, material and labor costs, selection of equipment, and cost reduction. Illustrative examples, tables, photographs, and problems are abundant.

Written by R. L. Peurifoy, professor of construction engineering at Agricultural and Mechanical College of Texas, the book is priced at \$8.50.

CONTRACTORS AND ENGINEERS

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24 HOURS DELIVERY FROM STOCK!

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Comes complete with 2-10 ft. cables, ground clamp and electrode holder.

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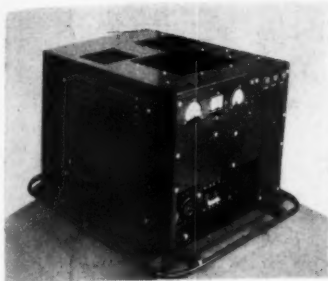
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Battery heater-charger

■ A new type of battery heater-charger designed to overcome difficulties in operating lead-acid storage batteries at extremely low temperatures has been announced by Fox Products Co. The device pre-heats the battery before charging begins.

The Fox heater-charger is said to overcome the major drawbacks of external battery heating methods by using the battery itself as the heat source. Alternating current is passed through the battery by attaching the heater directly to the battery terminals. The heat generated within the battery is directly proportionate to the ac resistance of the battery.

The Fox unit, designed for use with either 6 or 12-volt batteries, can be set to maintain the battery at any desired temperature automatically and indefinitely; to charge the battery at a pre-selected rate; and to simultaneously and automatically heat and charge the battery at the proper rate.

The power requirement is 60 cycle, single phase 115/230 volts. Maximum dc output for charging is 25 amps, while maximum ac output for heating is 500 amps for 6 volt batteries and 325 amps for 12 volt batteries.

For further information write to Fox Products Co., 4720 N. 18th St., Philadelphia 41, Pa., or use the Request Card at page 18. Circle No. 143.

Polish-made machine lays 60,000 bricks an hour

Polish engineers have designed and built a machine which lays 60,000 bricks an hour. The electrically operated "mechanical brick-layer" also spreads mortar, spaces openings for doors and windows, and can be used for walls of any height or thickness. One-man operated, the machine does not require bricklaying skill.

The new device was demonstrated in the city of Szczecin under the supervision of Zdzislaw Szczesny of the Municipal Building Enterprise.

Cemented carbides

■ The Carboly Department of General Electric Co. has issued a catalog on standard cemented carbide blanks for stone-cutting tools. The 20-page publication includes prices, dimensions, and specifications for various style tools. Information on masonry drills and the grinding procedure for resharpening carbides is given.

To obtain Catalog ST-100 write to Carboly Department, General Electric Co., P. O. Box 237, Roosevelt Park Annex, Detroit 32, Mich., or use the Request Card at page 18. Circle No. 5.

Portable two-way radio transmitter and receiver

■ A simplified hand-carried two-way radio transmitter and receiver is reported to send and receive clearly for over 10 miles in line-of-sight or one-half mile through obstructions.

The new Vocaline Model JRC-400 Transceiver operates at 465 megacycles over the Citizens Radio Band reserved by the FCC for short distance personal radio communication. The manufacturer emphasizes that a station license to operate the equipment is easily obtained by anyone over 18.

The operation of the Vocaline Transceiver is simple. The four-pound unit plugs into any 115-volt ac outlet of 6-volt dc supply. After a brief warming up, the sender simply pushes



in a button and talks into a hand-sized microphone. The message is received over the loudspeaker contained in the Vocaline unit. No tuning is needed, nor any special tools or apparatus.

For further information write to Vocaline Co. of America, Inc., Old Saybrook, Conn., or use the Request Card at page 18. Circle No. 120.

Calaveras Cement appoints

Harold A. Lovegreen has been named assistant sales manager of the Calaveras Cement Co., San Francisco, Calif. He will work directly with Mel J. London, vice president in charge of marketing, and William G. Jeffrey, Jr., dealer sales manager for the company.

Gardner-Denver...Serving the World's Basic Industries



Gardner-Denver Self-Propelled Air Trac Drills. 36 of these are working on the job.

Again...Gardner-Denver is first choice ...on the Massachusetts Turnpike

Project:

Over six million cubic yards of rock excavation on the 125-mile Massachusetts Turnpike, reaching from the outskirts of Boston to the New York state line.

Contractors:

A dozen big-name contractors from throughout the northeastern part of the country have chosen Gardner-Denver rock drills and portable compressors to help speed their contracts.

Gardner-Denver Equipment:

79 Heavy-Duty Gardner-Denver Rock Drills—more than all other makes combined. Included are:

- 42 Gardner-Denver Wagon Drills
- 36 Gardner-Denver Air Trac® Drills
- 1 Gardner-Denver Tractor-Mounted Drill

17 Gardner-Denver Compressors, supplying over 6,000 cfm of air power for the drills. On site are famous Gardner-Denver Rotary 600's, as well as Gardner-Denver 500 and smaller Portables, and Stationary and Tractor-Mounted Compressors.

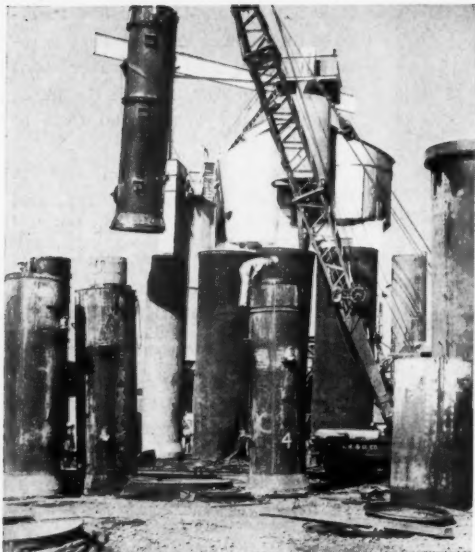
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 249



Prefabrication used for concrete aqueduct

A smoothly functioning yard, 70 miles from the project, turns out 42 to 132-inch sections, plus steel pipe

A heavy steel form shell for the large-diameter pipe is picked up by one of the two railroad cranes in the yard and moved to a base ring. About 30 sets of forms are in constant use.

conventional and shop-built construction, each of which is adjustable so that cages of various diameters can be made. One machine turns out 42, 48, 60, and 66-inch-diameter cages, the other completes cages for 78, 84, and 132-inch-diameter pipe.

Continuous reinforcing steel arriving at the yard in rolls is picked up

and spiraled on the drums of these machines in a few minutes. Then longitudinal steel bars are placed in position automatically and welded to the reinforcing steel to form a stiff frame. A Federal automatic welder does this work on the machine making small-diameter gates, and a Stryco fusing welder joints long-

The heavy pipe sections going into Davis Aqueduct, a part of the U. S. Bureau of Reclamation's Weber Basin Project between Ogden and Salt Lake City, Utah, are being turned out on an enviable schedule by United Concrete Pipe Corp., at its 15-acre yard at Pleasant Grove, Utah. United, which has its home office in Baldwin Park, Calif., is also the contractor on the 18-mile aqueduct being built 70 miles from the pipe manufacturing plant.

The Pleasant Grove site was originally established in 1938 to supply pipe for the USBR's Provo Aqueduct. Since that time, the amount of work done at the yard has fluctuated, but continuing experience has helped workmen to streamline the manufacturing process until it is now highly efficient.

Incoming material and outgoing pipe sections create a minimum of interference with yard operations. And since the manufacturing schedule is based on orders from jobs and coordinated with construction schedules, stockpiling and storage problems have been virtually eliminated. With U. S. 91 running nearby, and good rail transportation available, shipping is no problem.

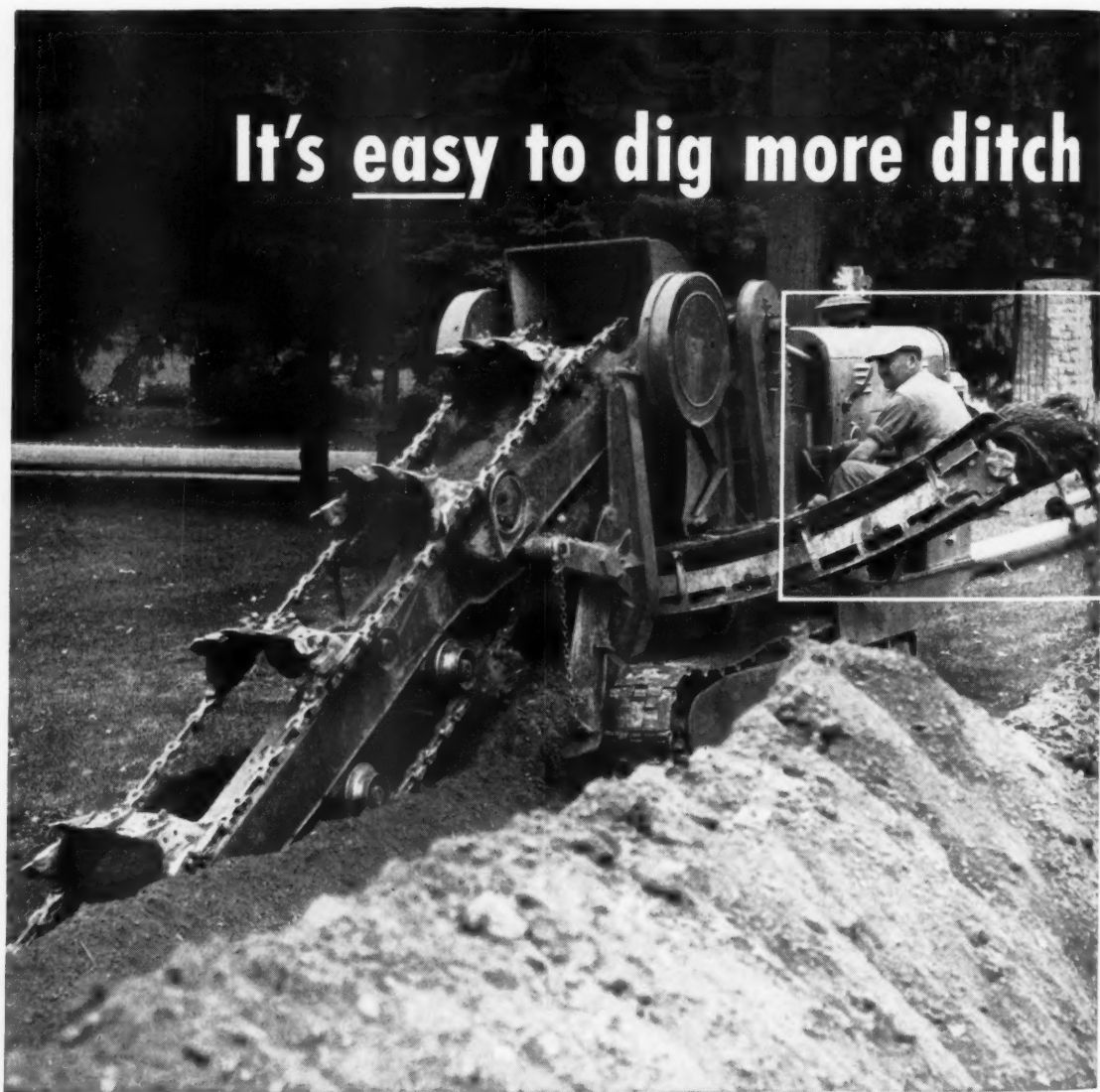
Pipe of 42, 48, 60, 66, 78, 84, and 132-inch diameters is being turned out regularly in the yard, not only for the Davis Aqueduct but for other projects. One corner of the yard, devoted to the manufacture of steel pipe out of flat plate steel stock, is providing 15 miles of 30-inch steel water pipe for a supply project for Grand Junction, Colo. All this work is being done under the supervision of E. N. Newberry, general superintendent.

Both concrete and steel pipe are being manufactured to close tolerances. The 132-inch-diameter concrete pipe, weighing about 30 tons, has tolerances as close as 1/30-inch. Heavy steel elbows, 6 feet or more in diameter, are also being made for bends in aqueducts.

Fabricating cages

The first step in pipe manufacture is the construction of steel reinforcing cages to close tolerances. This is done by two cage machines, both of

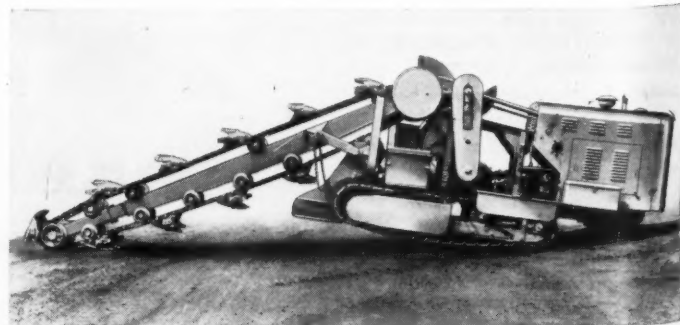
It's easy to dig more ditch

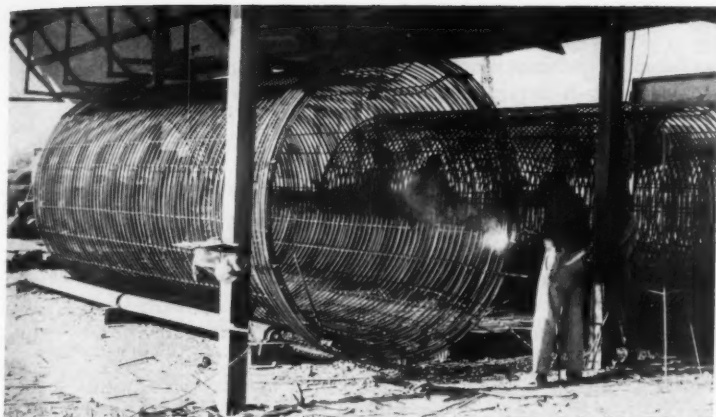


The Gar Wood-Buckeye 407 ditcher digs a full 10 feet deep, from 17 to 24 inches wide.

LIVE HYDRAULIC BOOM WITH POSITIVE DOWN-PRESSURE

The rugged boom on the 407 is raised, lowered and held by an independent, hydraulic control system. Positioning is fast and positive. Double-acting hydraulic cylinders provide full crowd. Illustration shows that down pressure of boom is sufficient to raise machine off ground!





A skeleton for a pipe section is formed as two cages are assembled, one inside the other, by workmen with Lincoln electric welding equipment. Cages move from here to the pipe forms.



After being formed on a cage machine, which can be adjusted to produce reinforcing of various diameters, a cage for a large-diameter pipe section is moved in the yard by a Hyster fork-lift. Steel form shells are in the background.

with a



407

Put yourself in the seat and see the difference...



SPEEDS YOU CAN FIND and use! One selector lever plus high-low range lever makes changing speeds easy. No complicated diagrams to figure out!



INDEPENDENT LEVER STEERING is exceptionally easy, positive and reliable. Each crawler has a separate clutch and brake... no tendency to wander!



PUSH BUTTON CONVEYOR SHIFT speeds work around obstructions. Just push the button to shift conveyor electrically while digging... no need to stop machine or leave seat.



INSTANT BOOM CONTROL, with live hydraulic action, makes it easy to maintain grade, clear underground obstructions. One convenient lever does it!

Fast, accurate adjustment for changing conditions saves time, boosts production

The 407 is far easier to operate, control and adjust than any other ditcher in its class. Here's why:

Streamlined and compact, the 407 has the smallest practical dimensions for the widest range of applications. Lowest overall height, 7 feet 3½ inches, for easy transport without disassembly. It's exceptionally maneuverable in close quarters... digs neat, clean ditch right up to walls and foundations. Also digs in reverse for tunnelling and undercutting.

Correct balance... light weight... low center of gravity... excellent weight distribution add up to greater stability on any grade. Rugged crawlers provide maximum traction and minimum ground pressure.

The Gar Wood-Buckeye 407 is the world's largest selling ladder-type ditcher! Find out why. Call your Gar Wood-Buckeye dealer or write: Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan.

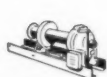
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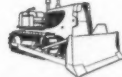
Gar Wood
Winches



Gar Wood-Buckeye
Ditchers



Gar Wood-Buckeye
Finegraders



Gar Wood
Tractor Equipment



Gar Wood-St. Paul
Hoists & Bodies

For more facts, use Reader-Reply Card opposite page 18 and circle No. 250

tudinal bars to spiraled reinforcing steel on the larger machine. Each machine turns out 12 to 14 reinforcing cages daily with only a crew of two men.

The usual reinforcing for each pipe section consists of two cages, one assembled inside the other. As cages are finished, they are picked up by Shaw-Box electric hoists or a Robbins & Myers electric overhead hoist, and carried to the assembly point. The smaller-diameter cage is placed inside the larger one, and both are joined by Lincoln arc-welding machines. The finished cages, consisting of the joined concentric steel spiraled framework, are then brought by a Hyster fork-lift to the point where pipe sections are constructed.

The steel cages are next assembled on base rings, together with inner and outer steel form shells. The rings and forms are scattered along two sets of 80-foot-long wide-gage railroad tracks, within easy reach of two self-propelled railroad cranes. Approximately 50 base rings and 30 sets for forms are in use most of the time, and a sufficient number of spares are available to meet peak demands.

Each concrete pipe section is made by setting the inner-wall liner in place on the base ring, installing the steel reinforcing cage, placing the outer-wall form in position, and tying the entire assembly tightly in place so that there is no form distortion when the pour is made. United Concrete Pipe Corp. is using approximately 75 Viber electric external-type vibrators to consolidate concrete. All of them are mounted in rigid brackets on the outside of steel pipe forms.

The concrete batching plant is located in the center of the yard, not far from the dual sets of tracks, so that the railroad cranes can reach both the batch plant and pouring points quickly and easily. Sand, and gravel, and crushed rock used in the concrete is trucked into the plant from commercial sources near Pleasant Grove.

A 6-sack, high-strength concrete mix is being used with Protex air-entraining agent to make the material more workable as it goes into the narrow form sections. Dry mixes pro-



In the steel-pipe section of the yard, a piece of flat steel stock, bent into a 24-foot section, is pulled out of the Hilles & Jones pipe bender by a Gardner-Denver air tugger. Welding and coating are done on assembly-line methods.

(Continued from preceding page)

portioned by the batch plant drop to a Koehring 34-S tilting mixer for a one-minute mix with the necessary amount of water. Concrete is then dumped to Gar-Bro buckets up to 2 cubic yards in size, which the railroad cranes bring to the tops of the forms. As a pour is made, a man on the ground turns on the Viber electric external-type vibrators.

After each section has been poured, live steam is turned on, and heavy canvas or lumber covers are placed over the freshly poured concrete. This steam cure continues for approximately 24 hours to accelerate high early-strength in each section. After 24 hours, the forms are stripped and the pipe stored on a ready rack near

a ramp where trucks load and unload. Peterbilt and Sterling transports hauling pipe to the job site simply back to the end of the ramp and, by means of their cable winches, take the pipe sections on their beds.

Steel pipe also made

UCP also has steel pipe manufacturing on a well-mechanized basis. Flat-plate steel stock, shipped in by rail, is routed quickly through several operations that turn it into finished steel water line.

In moving through this mechanized setup, a piece of flat steel work is first laid out on an assembly table and trimmed to exact size by a Niagara shearing machine. The assembly table is served at both ends by Gardner-Denver air tuggers powered by a small Gardner-Denver compressor. Using steel come-alongs, a man operating one of these tuggers can move a piece of steel stock quickly from the supply pile onto the bending table, positioning it accurately for the Hilles & Jones pipe bender that quickly shapes the steel into its permanently rounded form.

After being pulled out of the pipe-bending machine by another Gardner-Denver air tugger, the pipe moves to a set of assembly ways where two men with Lincoln electric welding machines spot the ends together with Lincoln's 85 welding rod. The 24-foot pipe then moves to an assembly table where a Lincoln automatic arc-welding machine completes the manufacturing process by welding in the longitudinal bead. Two 24-foot pipe sections are joined to form the 48-foot joints, being used at Grand Junction. A Lincoln 600-amp Autoweld is also used to put on this center joint. Before leaving the yard, each 48-foot joint is rolled over a well containing Fairbanks Morse centrifugal and deep turbine pumps for a hydrostatic test. The test shows whether or not the welds will stand up under 150-psi pressure. Any defects showing up at that point are promptly repaired by hand welding.

After assembly and welding are complete, each pipe section is rolled over the assembly ways to a pit where both internal and external sand-blasting removes all debris, mill scale, rust or other dirt so that a good bond is set up between the walls of the pipe and the bitumastic primer.

The primer is applied by a spray head, compressor-driven and mounted on a worm gear for steady traveling. A coat of coal tar enamel is spun on the inside of the pipe; the exterior is also coated with enamel, paper, and whitewash. This entire coating process is being done under contract by Pacific Pipeline Construction Co., Montebello, Calif., which is working closely with UCP throughout the job.

An efficient method of loading the 48-foot steel pipe sections onto trucks for the trip between Pleasant Grove and Grand Junction, Colo., is preventing the supply of pipe from backing up in the yard. Instead of 10 sections being pyramided on a truck-bed in the conventional manner, 16 of the sections are being transported

They're building Kansas City's new foundations —1,500 to 2,000 yards a day

Red D Mix's new fleet of GMC's helps speed in-a-hurry jobs like the 30,000-yard delivery for K.C.'s new municipal parking garage



THESE RUGGED GMC W624 TANDEMS are some of the 20 new GMC haulers handling Red D Mix's fast-moving, tightly scheduled jobs throughout the Kansas City, Mo. area. They recently completed

work on Kansas City's municipal parking garage—a multi-floor, block-square structure requiring 30,000 yards of concrete. Red D Mix helped finish this massive job in record time.



SPEEDING THEIR HEFTY 6-YARD LOADS from batch plant to job site, these GMC W624's set a crackling pace. The model is one of 19 new Blue Chip tandems blanketing the 28,000 GVW-90,000 GCW range. They offer a choice of gasoline and 2-cycle Diesel power. And 9 of them are available with cost-cutting Hydra-Matic.*

*Hydra-Matic standard on many models; optional at extra cost on some others



NOT EVEN THE ROUGHEST GOING can stop these GMC's. Their high-torque 190-h.p. engine packs more than ample reserve for off-the-road maneuvering. And the W624 has GMC's new oversized axles—11,000 lb. front and 34,000 lb. rear. Tires are 9.00/20's. The rig's rated for 42,000 GVW-65,000 GCW truck-work.

GMC TRUCK & COACH — A General Motors Division

For more facts, use Reader-Reply Card opposite page 18 and circle No. 251

CONTRACTORS AND ENGINEERS

Pipe sections are stacked on five 6 x 6 Douglas fir timbers, each of which has four concave cuts running its entire length—one at each corner. When placed side by side on the truckbed, the five timbers form semicircular cradles for four pipe sections. Another layer of timbers is placed over this first layer of pipe, the longitudinal cuts at the bottom of the timbers conforming to the rounded pipe sections underneath. Then a second layer of pipe sections is set in place. Four layers of four pipe sections each constitute a money-saving load. THE END

■ The 1956 edition of the directory of the American Council of Independent Laboratories, Inc., is now available. In addition to scope sheets for 67 member laboratories—providing details of facilities and services—this edition includes an extensive index of services and facilities.

The American Council of Independent Laboratories is the professional association of the nation's leading independent scientific laboratories.

Snow loader unit

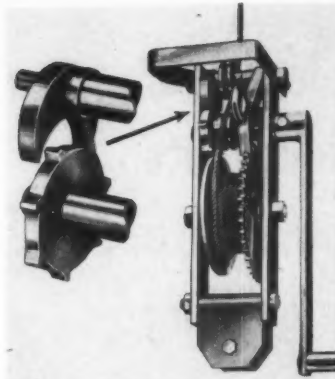
To obtain Form 3547 write to Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 177.

■ A mailing piece from Dryden Oil Co. lists the firm's line of lubricants. Among lubricants mentioned are all-purpose gear, open gear, viscous pressure, special pressure, block grease, air compressor, and graphite types. Also included is data on hydraulic, frigid ammonia, turbine, cylinder, and cutting oils. A brief description of each accompanies the listing.

For more facts, circle No. 252→

■ A new scaffold winch has an "escape" pawl which permits the operator to raise the winch as fast as desired, but limits lowering speed to 30-40 rpm. Should the handle of the winch be turned faster than this during let-down, or should the operator let go, a cam-lock engages in a special ratchet to stop the stage immediately.

This new Sasgen cam lock winch uses 3/16-inch galvanized-steel aeronautic cable. Sliding cable roller guides turn on zinc-plated shafts of



The cam lock shown enlarged at left is a new safety feature of this Sasgen scaffold winch.

For further information write to Sasgen Derrick Co., 3123 Grand Ave., Dept. CON, Chicago 22, Ill., or use the Request Card at page 18. Circle No. 157.

A new 16-mm sound-color film, "Under the Shovel", featuring the Model UD 10-ton rear dump has been released by the Euclid Division of General Motors Corp., Cleveland, Ohio. It may be ordered from Euclid.

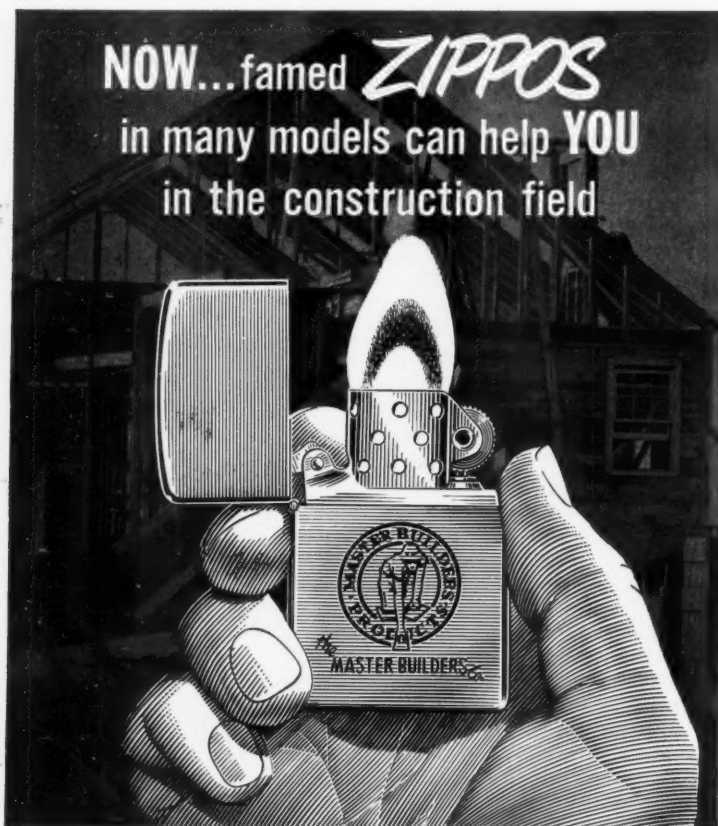


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Creek relocation, deep cuts complicate bypass grading

**Wide right-of-way requires 100-foot
sidehill cuts; excavated creek silt is
replaced by good fill material**



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Working alongside the new channel for Loyalhanna Creek, a Caterpillar D8 and LeTourneau 8-yard scraper help prepare the subgrade for the new bypass. Sidehill cuts yielded suitable subbase material.

C&E Staff Photos

In one of the toughest phases of a 4½-mile highway relocation project currently being brought to completion near Ligonier, Pa., the contractor had to make a sidehill cut of more than 100 feet, both to widen the bypass right-of-way and allow ample room for a new channel for Loyalhanna Creek. At the same time, since part of the road runs across the old stream bed, the creek bottom silt had to be excavated and the area backfilled with suitable subgrade material.

The present highway, U. S. 30, consists of two 11-foot lanes that fan out into a four-lane divided highway about two miles west of Ligonier. When Latrobe Road Construction Co., Inc., Latrobe, Pa., completes its \$1,758,058 project in July, a four-lane highway will replace the two-lane stretch of the existing route for about a mile. The remainder of the new road will consist of two 22-foot lanes. The existing two-lane U. S. 30 will become the westbound roadway; the bypass around Ligonier will become the eastbound roadway. Though the entire job might have been done by building a 22-foot roadway adjacent to the existing road, the mile-long stretch

of four-lane highway is being built to improve alignment with the new bypass.

Work at creek

Excavation of the new creek channel was done by a Manitowoc 3000 dragline with 2-yard bucket and a Northwest truck-crane with ¾-yard dragline bucket. A total of nine Euclid 12-yard end-dumps removed about 84,000 cubic yards of the unsuitable silty material, wasting it along the right of way where seeding and planting will be done later.

To handle the 100-foot sidehill cut and the backfilling job, the contractor brought in a LeTourneau 8-yard scraper, Gar Wood 20-yard scraper, and Gar Wood 18-yard scraper—each pulled by a Caterpillar D8 tractor—and three Caterpillar DW20 scrapers pulled by Allis-Chalmers HD-20 tractors. An Allis-Chalmers HD-19, an HD-15, and three additional Caterpillar D8's, one of them for pusher use with the scrapers—completed the list.

Excavation from the sidehill cuts, used as the roadway subbase, was pushed ahead by the fleet of tractors. The fill, totalling 246,000 cubic yards,

"LOWEST MAINTENANCE COST OF ALL OUR DITCHING MACHINES"

Says: George Gabrielse
GABE'S CONSTRUCTION CO.
SHEBOYGAN, WISC.

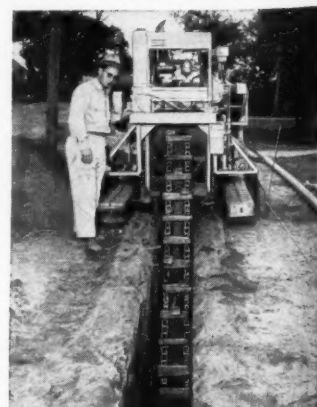
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and DOWN TO 6' DEEP!

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PELLA, IOWA



For more facts, use Reader-Reply Card opposite page 18 and circle No. 254

CONTRACTORS AND ENGINEERS



As soon as silty creek-bottom material has been removed, fill hauled by scrapers from side-hill cuts is dozed over the former alignment of Loyalhanna Creek by a Caterpillar D8 and an Allis-Chalmers HD-15 tractor.

While the old creek is being filled in, two draglines excavated a channel for the new stream. Material being excavated by this Manitowoc 3000 crane with 2-yard bucket is being wasted along the right-of-way.



was placed by the scrapers in 4-inch layers and compacted by a Buffalo-Springfield four-wheel Kompactor and a Buffalo-Springfield 10-ton three-wheel roller. As the fill was pushed out over the excavated creek-bed by the tractors, the two draglines kept busy digging the new channel. The largest fill was 40 feet.

The bypass right-of-way is being made wide enough for two 11-foot reinforced-concrete lanes, two 10-foot stabilized outside shoulders, and an additional two lanes that will be built in the future so that through traffic can completely bypass Ligonier.

A special subgrade, consisting of a 6-inch layer of crushed sandstone, will be put down as a base for the 9-inch reinforced-concrete slab. The porous nature of the stone will take care of subsurface drainage.

The special subgrade material and the concrete for the paving will be supplied by the contractor from his own quarry. Latrobe owns and operates a commercial quarry a few miles from Ligonier, in which is an asphalt and concrete batch plant.

Fred Riggs is the superintendent for Latrobe.

THE END

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THURMAN PORTABLE truck scales!

EASIEST Truck Scale to move from job to job

Eliminate costly concrete pit installations . . . move your scale from job to job. You can, if you weigh with a Thurman Portable. Assured weighing accuracy even under the most difficult conditions. Choose any level area, place the scale, ramp earth at both ends and drive your trucks on. That's it! Capacities: 20 to 50 ton, Deck Lengths: 18 to 43 ft. Write today for bulletin 601.



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For more facts, circle No. 257



In a mountainous stretch, the 26-foot-long sections of 48-inch pipe are placed with the aid of a winch-operated cable carrier. The foreman gets his instructions via a portable telephone.

Rugged country complicates work on water supply line

The inadequate water supply of Caracas, Venezuela—creating a problem that has been aggravated by a tripling of the city's population in the last fifteen years—will be a thing of the past when the new water system is brought to completion next year.

Getting water from the Tuy River to the city, three miles distant, is making it necessary to construct a small dam on the river, 17 miles of 48-inch-diameter pipeline, four pumping stations, two tunnels and 128 ravine crossings among other structures. In mountainous stretches, the 26-foot-long pipe sections had to be placed by a winch-operated aerial cable.

The present water supply system for Caracas consists of reservoirs served by two mountain streams, plus artesian wells in the city. This supplies Caracas with a flow of 528 gallons of water per second. But this is not enough to meet the demands of the population, which now stands at a million and is still growing. During the six-month dry season, the water supply occasionally falls below the minimum level, leaving some sections of the city without water for days at a time.

The new system will supply the city with an additional 792 gallons of water per second, and if warranted, it may be augmented by a larger dam on the Tuy River, which has an average flow eight times the amount used by the system now being built.

Construction of the \$42,600,000 system is being done by an association of a group of Swiss and German companies, Constructores Industriales en Ultramar, for the National Institute of Sanitation Works, an autonomous government agency in charge of water supply and sewage systems for the country.

Plans for the system were adopted in 1953, after eight possible means of getting water to the city had been considered for the previous six years. The four pumping stations along the route are being built to raise water from a level of 433 feet above sea level at the river to 3,470 feet at the highest point of the pipeline. Since each additional foot of altitude is calculated as involving an extra cost of \$9,150 for the line, two tunnels are being bored through mountain ridges, to save 50 per cent of what it would cost to run the line over the peaks.

Pumping stations

River water diverted by the dam will first go through concrete pipes to sedimentation beds, where sand will be allowed to settle, then through a concrete lined tank to be treated

MORE PULL WITH LESS FUEL!

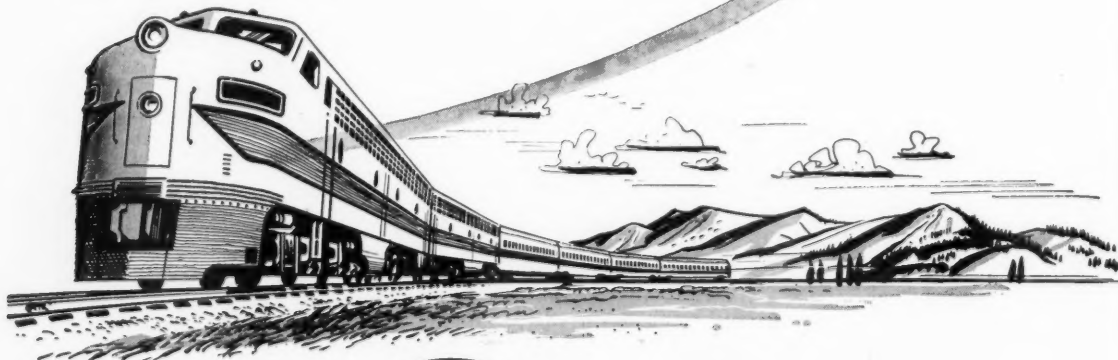
**AiResearch Turbochargers provide rapid response to
acceleration demands...end objectionable smoking!**

Consider what the application of AiResearch Turbochargers to diesel locomotives will accomplish: A team of these small power packages will provide a greater increase in power at smaller cost in space and weight than any comparable turbocharger or supercharger installation.

In addition, specific fuel consumption on a horsepower per hour basis will be far less. Sea level performance will be restored within operating limits at altitude, response to acceleration demands will be rapid and excessive smoking under operating power eliminated. Also, the noise level will be greatly reduced.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 258

Pumping station, tunnels, numerous structures form part of 17-mile pipeline in Venezuela

with lime and other chemicals before entering the pipeline.

The first pumping station near the Tuy River will pump water to a nearby hilltop, where a concrete tower with a disposal pipe will serve as an "escape valve" if other stations along the route break down and excess water builds up in the line. In such a case, excess water will be carried out of the line at the top of the disposal pipe.

Each of the four pumping stations, equipped with four electric pumps, will raise the water to a high point, where similar concrete towers are located. Water will flow to succeeding pumping stations by gravity.

Between the first and second pumping stations, an 18-foot high concrete reservoir is being built to help control the flow of water through the line. It will have a capacity of 792,000 gallons, and help compensate for any sudden changes in water pressure in the line.

Big tunnel

The longest of the two tunnels under construction runs one mile through the Guayabo Mountain to the Mariposa Reservoir, where the pipeline ends. A small-gauge railway serves both ends of the 6-foot tunnel, and small pumping stations keep it free of seepage.

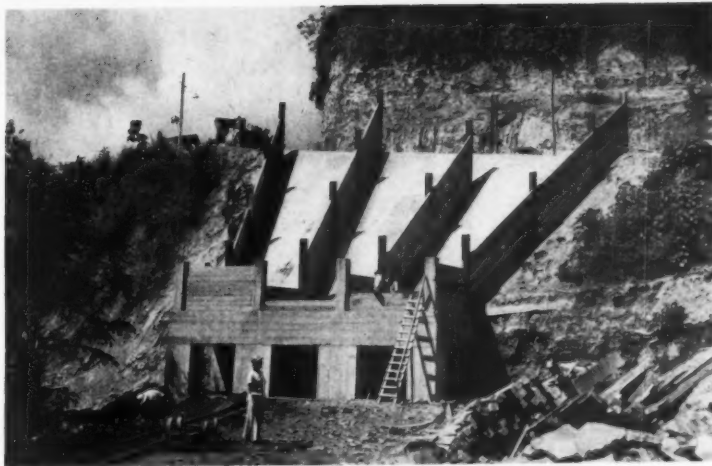
Water emerging from the tunnel will follow the riverbed of the Valle River for a mile and a half before flowing into the Mariposa Reservoir. The Mariposa Reservoir, currently supplying 40 per cent of the city's water, has a capacity of 3½ billion gallons and is capable of supplying Caracas with water for six months—the length of the dry season.

Facilities at the treatment plant near the reservoir are being enlarged to accommodate the increased amount of water to be handled. Two new sedimentation beds, work on the filter system and twelve additional filter control tanks in addition to the six now in operation, are expected to be completed by the middle of this year.

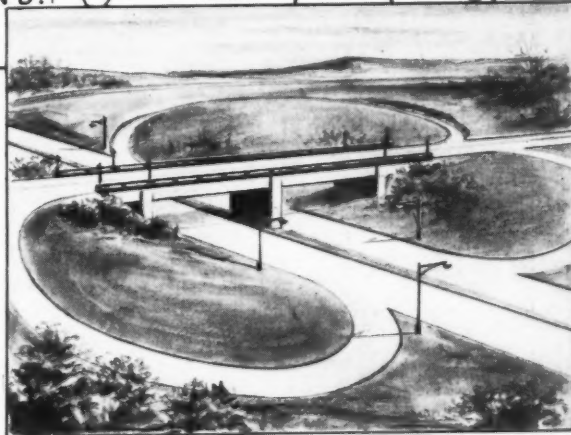
THE END

Oklahoma trains students for highway positions

In order to ease the growing shortage of highway department personnel, C. A. Stoldt, state highway director for Oklahoma, has initiated an on-the-job cooperative formal engineering course for students of Oklahoma University, Oklahoma A&M, and present employees of the department. Completion of the course, requiring six years, will entitle participants to a B.S. degree.



Work continues at the portal of one of the tunnels in the supply system. Running the line over the mountain would involve an extra cost of \$9,150 per foot of altitude; boring through the ridge cost about half as much.



**282
BRIDGES
IN 241 MILES
ON THE
OHIO TURNPIKE**

...and McKiernan-Terry a popular choice for pile driving

The many bridges which carry intersecting highways over or under the Ohio Turnpike are quite similar in design. Of interest are the many instances in which unrelated contractors chose McKiernan-Terry Pile Hammers to drive the piles for the abutments and the piers all along the 241-mile length of the turnpike.

In the construction of turnpikes and thruways in New York, New Jersey, Pennsyl-

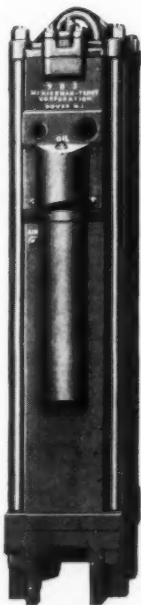
vania, Indiana, New England and other sections of the country as well, McKiernan-Terry pile-driving equipment has helped contractors do their portions of the projects speedily and economically.

Write for bulletins on the extensive McKiernan-Terry line of single-acting and double-acting pile hammers, double-acting pile extractors, pile hammer leads and accessories.

McKIERNAN-TERRY CORPORATION

Manufacturing Engineers • 82 Richards Avenue, Dover, New Jersey

For more facts, use Reader-Reply Card opposite page 18 and circle No. 259



Radio dispatching system aids truck scheduling

■ A radio dispatching system designed to help utilize trucks to maximum advantage, has been announced by Radio Corp. of America. The RCA dispatching system, built around a systematized card rack, will enable dispatchers or management personnel to determine at a glance the immediate destination, schedule, and load of each truck.

The card rack is a compact, tiered unit, containing 54 clear-plastic slots, which can be adapted for virtually any type of fleet operation or for daily changes in procedure. The rack includes removable snap-on metal tabs for use in assigning and identifying slots for each of the company's route

The RCA radio dispatching rack has removable snap-on metal tabs that can be marked and placed to identify slots according to route areas and individual trucks in each area.

areas, and for individual trucks operating in each area.

The system includes individual pickup memo cards which are filled out as incoming orders are received. The cards are delivered to the dispatcher who assigns each destination



to a given truck by radio and files the card in the truck's indicated slot in the card rack. Special colored indicator cards are also provided so that the dispatcher can continuously separate the cards in each file according to pickups completed and to be made.

The systematized 54-slot card rack, ample for most fleet operations, measures 13 inches high, 26 inches wide, and 13 inches deep. A second rack can be attached to the basic unit to double the slot capacity for larger operations.

For further information write to the Radio Corporation of America, RCA Bldg., 30 Rockefeller Plaza, New York 20, N. Y., or use the Request Card at page 18. Circle No. 134.

Compressors now have deeper oil pans

■ All Le Roi two-stage portable compressors and self-propelled Tractairs are now manufactured with new, deeper oil pans, the manufacturer reports. The new oil pans allow the portable units to operate at angles up to 20 degrees and the Tractairs at angles up to 25 degrees. Both are more than double the previous operation angles, an advantage when working in rugged terrain. The 365-cfm and 600-cfm Le Roi compressors have been equipped with the deeper oil pans for several years.

All Le Roi single stage compressors, the 85 and 105-cfm, and the 105 truck-mounted utility unit, are still manufactured with the same oil pan previously used. The reason for this, it is pointed out, is that these smaller compressors are used nearly entirely for street repair and maintenance work, where steep slope angles usually are not encountered.

For further information write to the Le Roi Division, Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 136.

Self-forming packing

■ A new self-forming and self-lubricating Flexrock packing offers a simple solution to the problem of stocking a pump packing of different sizes, shapes, and types.

One size of the new packing can be used to make a solid, lead-like, leak-proof seal the exact size and shape of any pump stuffing box or fitting. Flexrock packings are manufactured in two formulations. Each of these is available in coil or spiral form, and in shredded or bulk form.

For further information write to Flexrock Co., 3656 Cuthbert St., Philadelphia 1, Pa., or use the Request Card at page 18. Circle No. 145.

Pipe tool catalog

■ Beaver Pipe Tools, Inc. has published a catalog describing changes in its equipment and new models. Among the revised equipment are threaders, lightweight ratchet threader, and high speed portable pipe machine. New products include a power grip chuck, quadra-type diehead, power drive, quadra-type threader, a new line of geared pipecutters, and abrasive cutting machine. Complete specifications, prices, and outstanding features are given.

To obtain this catalog write to Beaver Pipe Tools, Inc., 300-500 Dana Ave., Warren, Ohio, or use the Request Card at page 18. Circle No. 26.

CONTRACTORS AND ENGINEERS

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VERSATILE
ACCURATE
FAST
LOW COST



Ideal trencher for scores of jobs:

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SERVICE LINES
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IRRIGATION

Here's the handiest machine you ever owned—a fast, low priced, mobile tractor-mounted trencher for utility lines, foundations, sewer systems, septic tanks, etc. You'll find this ladder-type trencher working all the time. Cuts 6" to 20" wide trench down to a depth of 7'. Average digging speed 350' to 400' per hour—digs up to 800' per hour. Cuts through all soils the year 'round. Special chisel type cutters for rocky or frozen ground. Independent control of each drive wheel assures exact and easy regulation for either straight or curved trenches. Mounts on Ford or Ferguson tractor—easily driven from job to job—one man operated. Bulldozer blade available for backfilling. Write for all the facts today.

ARPS CORPORATION

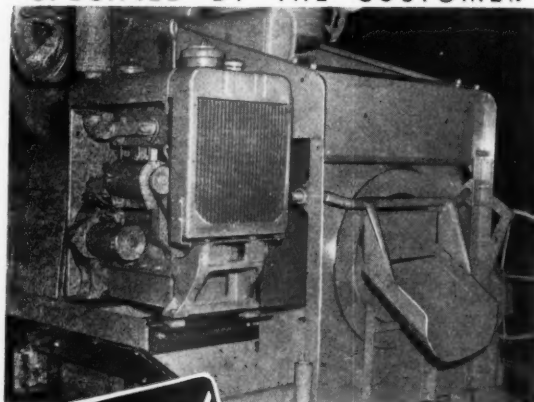
DEPT. C6E

NEW HOLSTEIN, WIS.

PRODUCTS FOR BETTER FARMS, BETTER INDUSTRIES SINCE 1920

For more facts, circle No. 260

SPECIFIED BY THE CUSTOMER



Sheppard
DIESEL
20 H.P.
Model 17

Replaces Gasoline Engine on Concrete Mixer

With the Sheppard Model 17, the Chain Belt Co. was able to provide its contractor-customer with rugged, low-cost diesel power to meet his special needs. Only minor changes were needed to adapt the Model 17 to their standard machine. It will fit into your equipment with equal ease.

Goes into same space as standard engine used on Rex 115 Mixer.

For complete Model 17 data, write:

SHEPPARD DIESELS
HANOVER 7, PA.

BUILDERS OF DIESEL ENGINES, TRANSMISSIONS, REAR AXLES AND POWER STEERING UNITS FOR INDUSTRY

For more facts, circle No. 261

Important Information on NEW



OLSEN
SOIL
TESTING
EQUIPMENT

If you're interested in modern soil testing you'll want a copy of the new Olsen bulletin describing the only complete line of light weight, portable machines—including compression, and direct shear testing equipment.

Write for a copy of Bulletin 50 today.

TINIUS OLSEN TESTING MACHINE CO.

2100 Easton Road Willow Grove, Pa.

For more facts, circle No. 424



Plastic flagging tape

■ A new embossed-surface ribbon flagging has been introduced by Surveyors Service Co., 2021 South Grand Ave., Los Angeles 7, California. The flagging is made of Monsanto's Ultron vinyl film. Flexible, yet tough and strong, the new Servco ribbon flagging handles with unusual ease.

The Servco flagging is reported to be non-toxic and flame resistant, and will not fade or stiffen upon prolonged exposure to sunlight. It is flexible at low temperatures.

Supplied in a pocket-size 300-foot roll, the flagging is available in brilliant orange, yellow, blue, red or white.

Other features claimed for the embossed Servco flagging tape include the fact that ball point pen or pencil can be used to write on its surface. The tape also tears clean, eliminating waste.

For further information write to Surveyors Service Co., 2021 S. Grand Ave., Los Angeles 7, Calif., or use the Request Card at page 18. Circle No. 149.

Portable power sprayer develops high pressure

■ A new power sprayer has been added to the Garden King line of sprayers and dusters made by D. B. Smith & Co. The 12-gallon-capacity



unit is recommended for roadside work and weed and brush killing.

The Garden King power sprayer is equipped with a four-cycle $\frac{3}{4}$ -hp gasoline engine. The pump delivers up to 1½ gpm with adjustable pressure ratings to 150 psi. A slight nozzle adjustment changes spray pattern from fine mist for broad coverage to long stream to reach high limbs and other distant objects.

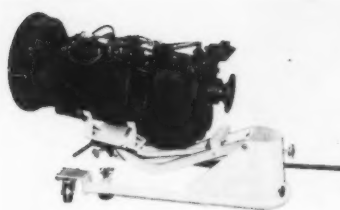
For further information write to D. B. Smith & Co., 470 Main St., Utica 2, N. Y., or use the Request Card at page 18. Circle No. 114.

For more facts, circle No. 262→

Transmission dolly speeds truck maintenance

■ A new dolly that lifts and moves a 1,200-pound transmission to speed maintenance of heavy trucks has been placed on the market by Cam Tool Co., 11 Randwick Ave., Oakland 11, Calif.

Hydraulic controls move the 13 × 14-inch sliding transmission platform forward at any desired angle, independent of the dolly frame, to align accurately for inserting the spline. A position lock holds the dolly to the floor while the transmission is being removed or installed.



The new Cam transmission dolly is designed to handle a 1,200-pound transmission.

The dolly is equipped with a portable hydraulic jack for raising and lowering and has a hand wheel for

adjusting the tilt of the platform.

For further information write to the company, or use the Request Card at page 18. Circle No. 119.

Davey Compressor names new division manager

Heading the rotary drill and air tool divisions of Davey Compressor Co., Kent, Ohio, is J. W. Kiddy. He will direct the sales of Davey truck-mounted rotary drills for all types of construction operations, and will also be in charge of sales of paving breakers, rock drills, clay spades, sheeting drivers, backfill tampers, etc.



S & M Construction Company, Providence, R. I., uses 12 of these Mack LJSWX diesel dumpers under 2-yard Lorain shovel in excavating peat bog near Atholl, Mass., on a by-pass for U. S. Route 20.

ONLY A SPECIALIST NEED APPLY...

... For only Macks can get in and out of mud like this under their own power!

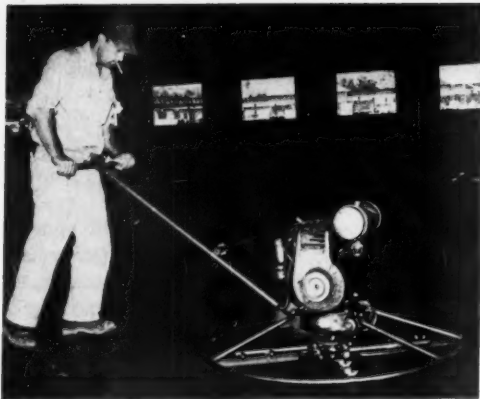
Axle deep in soft, soupy mire and hauling a full load of heavy peat bog, 80% water, this Mack dumper will pull out of the muck and be on its way . . . and back again on schedule.

It's Mack's famous Balanced Bogie, along with Mack's exclusive Power Divider, that makes seemingly impossible tasks like this everyday assignments for Macks. This wonder-working team delivers torque to each wheel in proportion to its

traction. In addition, it assures uniform tire loading and braking on all four rear wheels, and maximum stability under any terrain or road conditions.

When you add the Balanced Bogie and Power Divider to Mack's rugged construction, ease of maintenance, and economy of operation, you'll see why Macks are the most versatile trucks, the biggest money makers in the construction industries today. See your Mack Branch or Distributor for complete details. Mack Trucks, Empire State Building, New York 1, N. Y.

MACK... first name for trucks



The Stow G46 floating and finishing trowel.

Big 46-inch power-trowel

■ Stow Manufacturing Co. has put on the market a rotary trowel that covers 11 square feet of surface per revolution.

This is almost double the surface covered by a medium-size machine, like Stow's G34. The 46-inch trowel has 4 blades, which reportedly provide quicker and smoother trowelling, and

also make a flatter floor. The blades knock off high spots and fill in low spots.

The Stow G46 Roto-Trowel has a stationary guard ring which protects the blades and supporting arms from damage from obstructions. The ring also makes it easy to work right up to walls.

Also, a manually-actuated clutch controlled from the handle stops the machine from rotating the second the operator lets go of the handle. With this clutch, in contrast to machines with centrifugal clutches, the engine of the G46 can be started up at full throttle.

For further information write to Stow Manufacturing Co., 443 State Street, Binghamton, N. Y., or use the Request Card at page 18. Circle No. 150.



The Motorola Handie-Talkie.

Private paging system

■ A new Motorola transistorized radio pager makes it possible to call key personnel individually. The Handie-Talkie low-frequency radio paging system not only alerts and informs the paged staff member anywhere within a restricted plant or building area, but also does away with the necessity of audible and disturbing public-address-type paging and bell or chime systems. No one except the person called is aware that a message is being transmitted.

The system consists of a selector console with individual buttons for key personnel, an FM transmitter that radiates alerting tones and voice messages within a confined induction loop area, and the individual, all-transistorized Handie-Talkie radio receivers themselves.

Up to several hundred persons can be paged individually with a system, and the additional channel capacity can be added as needed. No FCC license is required for the system because it utilizes the inductive loop method of restricted signal radiation rather than far-ranging radio signals.

For further information write to Motorola Communications & Electronics Div., 4545 W. Augusta Blvd., Chicago, Ill., or use the Request Card at page 18. Circle No. 140.

Reciprocating feeders

■ Heavy-duty reciprocating feeders are detailed in a bulletin from McLanahan & Stone Corp. These feeders range in size from 16 x 48 inches to 72 x 93 inches, with 3 to 15 horsepower. Self-contained design, and a bottom feed principle are among the features illustrated.

To obtain this bulletin write to McLanahan & Stone Corp., Hollidaysburg, Pa., or use the Request Card at page 18. Circle No. 25.

Torque converters

■ Friction clutches, fluid drives, and torque converters for manual, air-actuated, or hydraulic control are presented in a brochure from Twin Disc Clutch Co. With various models are descriptions and specifications.

To obtain this brochure write to Twin Disc Clutch Co., 1361 Racine St., Racine, Wis., or use the Request Card at page 18. Circle No. 67.

New HYDRA-LIFT

features...



1. Outrigger Placement



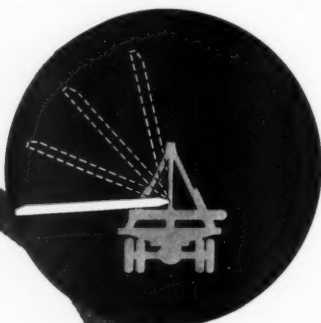
HYDRAULIC TELESCOPIC BOOM* gives you amazing load-handling versatility. Telescopes from 17 to 27 feet. Powers full-capacity loads into and out of tightest spots. Does jobs you used to say couldn't be done with a crane. Hydra-Lift gets lifting jobs done twice as fast, speeds up work of your entire crew.

*Hydraulic Telescopic Boom Optional. Standard Boom Is Tubular, Telescopes Manually 12' to 17' to 22'.

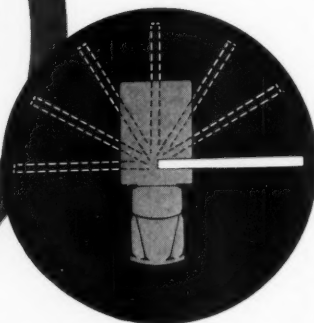


ONLY 40 INCHES BEHIND CAB—Hydra-Lift lifts up to 6500 lbs., yet requires only 40" behind truck cab. Hydra-Lift can load and unload its own truck bed. Installs easily on any truck two tons or larger. It's part truck, part crane, with the usefulness of both at a fraction of the cost.

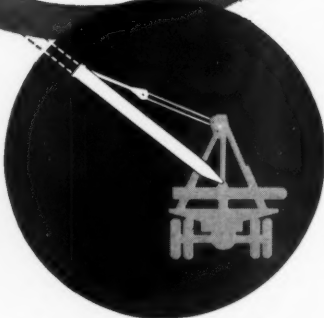
four All-hydraulic Operations!



2. 100° Boom Hoist



3. 180° Boom Swing



4. Telescopic Action of Boom

SIMPLE WRIST ACTION

Thanks to smooth dependable hydraulic power, every boom action — plus operation of outrigger legs — is accomplished by easy movement of simple push-pull levers. Load-line is operated by easily-engaged power-up, power-down winch. No difficult foot-and-hand coordination. No jerking or slipping of load. Controls inside the truck, outside or both.

Please send me full details on the Pitman Hydra-Lift, Model 60.

Name _____

Company _____

Street _____

City _____ State _____

PITMAN MANUFACTURING COMPANY

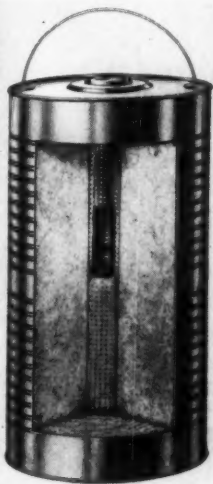
300 W. 79th Terrace

Kansas City, Mo.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 263

Special cartridges made for oil-filter series

■ Three new oil-filter cartridges for its 750 series filters are being provided by Wix Corp., Gastonia, N. C.,



A Wix can-type oil-filter cartridge.

to service Wix filters WF-750, WF-750-C, and Luberfiner filters 750, 1500, and 2250.

The Wix Hevi-Duty sock-type cartridge CW-750 and can-type CW-750-M contain Wixite, a depth-type filtrant of highly absorbent white cotton yarn blended with specially-treated wood fibers to prevent matting and channeling. The can-type CW-750-MS cartridge has a filtrant consisting of paper, wood flock, and a resinous bonding agent. These are heat treated for long life and high filtering efficiency. According to the manufacturer, none of the cartridges will remove detergents or other additives from heavy-duty oils.

For further information write to the company, or use the Request Card at page 18. Circle No. 36.

Reinforced-concrete pipe

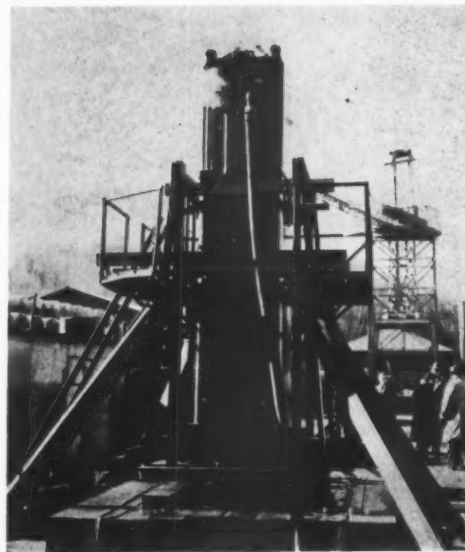
■ American-Marietta Co. has issued a catalog on Lo-Hed reinforced-concrete pipe for culverts and sewers. This pipe has a lower crown than other pipes, and is thus said to allow sufficient cover to reduce frost heave and to require less digging. A complete range of sizes in equivalents of round pipe sizes 18 through 144 inches is available. Tables show dimensional and quantitative data, hydraulic properties of the pipe, and discharge curves.

To obtain Form No. LH55 write to American-Marietta Co., 101 E. Ontario St., Chicago 11, Ill., or use the Request Card at page 18. Circle No. 9.

Detroit Diesel appoints new advertising manager

D. J. Clymer has been promoted to the post of advertising manager of the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich. With the company since 1943, Mr. Clymer has served successively as a member of the technical publications department, director of distributor sales management programs and national trade shows, and as assistant to the advertising manager.

OPERATIONAL TESTS on the world's most powerful pile hammer have been completed at the Dover, N. J., plant of the McKiernan-Terry Corp. The steam-driven hammer will be used to drive piles supporting "Texas Towers," man-made islands which mount drilling equipment for offshore oil exploration in the Gulf of Mexico. Weighing 20 tons, the hammer has a 10-ton ram, and delivers 60 blows a minute with a force of 60,000-foot-pounds. For further information write to McKiernan-Terry Corp., 100 Richards Ave., Dover, N. J., or use the Request Card at page 18. Circle No. 152.



Big output is built in

Individual Design

We believe that the right way to build an excavator is to match every part—from boom point to treads—to the specific rated capacity of the machine. At Bucyrus-Erie we call this Individual Design.

Here's what it means

Individual Design means striking the right balance between power, weight and speed for sustained high output at low cost over a long period of time. Bucyrus-Erie excavators match engine to dipper size so there's no waste of power; deck machinery components are not overloaded or underworked; boom strength and weight are right for the dipper size. There's never any overdipping or underpowering.

Here's how it pays off

This kind of design keeps Bucyrus-Erie excavators out front in production, with all parts working in smooth, efficient coordination. It keeps them on the job year after year with minimum down time and maintenance—there is no excess wear and tear on moving parts.

Individual Design is a big reason why Bucyrus-Erie excavators are still working profitably when others have lost their usefulness.

Your operations can use this kind of money-making performance so get the full details from your nearby distributor. He has all the facts on Bucyrus-Erie excavators from 3/8 to 4 cu. yd. 155E55

A grading project on U.S. Highway 85-87, near Greenhorn, Colo., was handled by this 1 1/2-yd. Bucyrus-Erie 38-B. Machine owner is the Pioneer Construction Co. of Pueblo, Colo.

**BUCYRUS
ERIE**

South Milwaukee, Wisconsin



For more facts, use Reader-Reply Card opposite page 18 and circle No. 264

Mackinac Bridge takes shape

Substructure, requiring 440,000 cubic yards of concrete is brought to completion in record time with Prepakt method

Merritt-Chapman & Scott Corp., New York, N. Y., placed 320,000 cubic yards of concrete last summer to substantially complete the \$25,735,000 substructure contract on the Mackinac Bridge in Michigan. During October, 1954, a world record had been established on this job when the floating concrete plant, Algonquin, placed 1,800 cubic yards of underwater concrete in an 8-hour shift; 5,040 yards in a 24-hour day; and 20,560 in a 5-day week. In May, 1955, the Algonquin broke its own record by placing 6,250 cubic yards in a day and a total of 110,000 during the month.

Setting the cylindrical steel caissons for the two tower piers of the bridge in the rock bottom of the Straits of Mackinac also established a record, for this is the deepest pier of the open-caisson type. These two piers

were set at depths of 210 and 205 feet below water level, respectively, surpassing the record held by the San Francisco Bay Bridge, which has one multidomed caisson 240 feet deep.

By springtime, when ice in the straits had begun to break up and the weather cleared enough to permit M-C&S to resume full-scale operations, the work was only 52.2 per cent finished and 55.7 per cent of the allotted time had elapsed. Three months later, when 73.7 per cent of the completion time had elapsed, the work was 85.2 per cent finished. A period of exceptionally fine weather and a round-the-clock operating schedule for the huge fleet of floating equipment had turned the tables.

Spanning the four miles of the Straits of Mackinac between St. Ignace and Mackinaw City, Mich., the

(Continued on page 76)



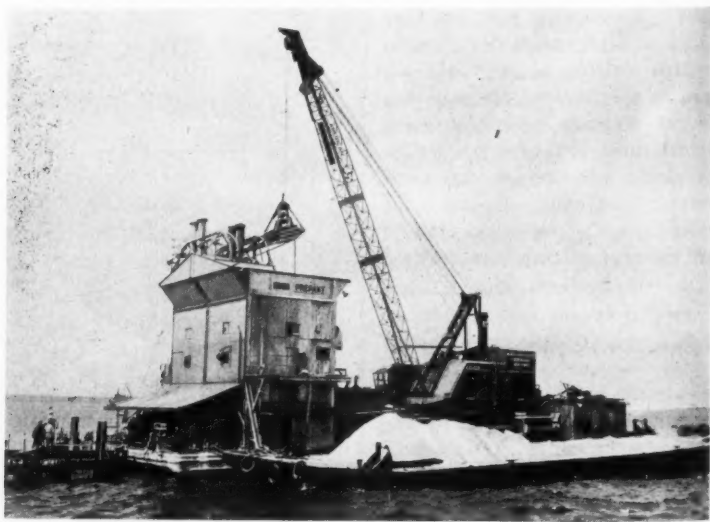
Cement hauled from a mill at Petoskey, Mich., arrives at the loading dock in two Gramm self-unloading trailers pulled by Mack trucks. Each rig hauled 150 barrels of cement per load. Transfer equipment loads the cement into barges.

C&E Staff Photo



A special hopper is used to load cement and fly ash into the U. S. Sealdbin 70 rubber bulk containers that are placed on a barge and hauled to the concrete plant.

C&E Staff Photo

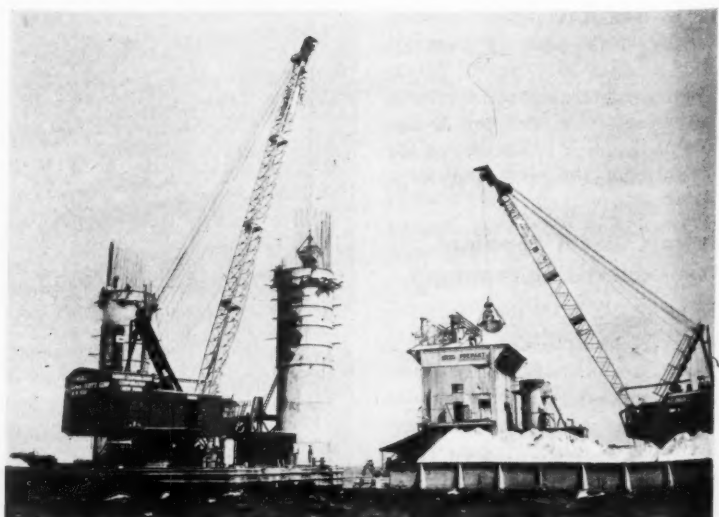


An American R-15 Revolver places concrete for the underwater portion of one of the piers. Grout mixed in the floating plant is pumped through pipes into the aggregate. A sand barge tied to the cement plant is held in reserve.

C&E Staff Photo



A self-unloading lake steamer fills a caisson with aggregate. Delivered directly from Drummond Island to the job, the rock is discharged into the caisson. Mortar is then added from the floating concrete plant at the left.

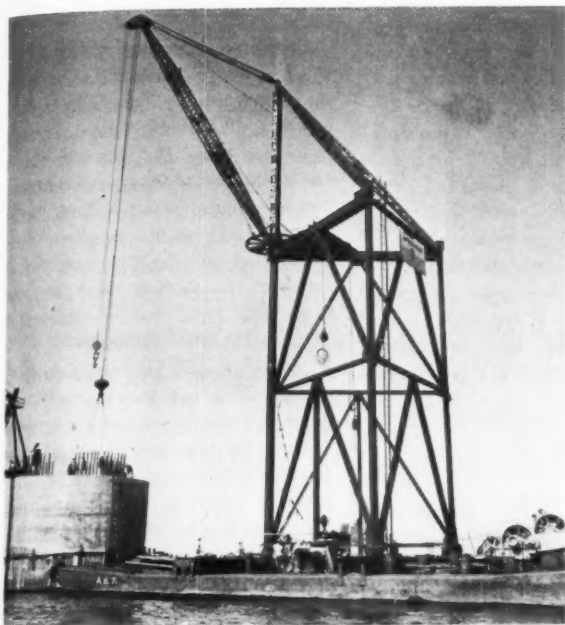


Cylindrical forms that shape the stem of pier 18 are filled with rock aggregate by the American R-15 Revolver, Creole. At right, an American crane charges the Butler bins on the floating concrete plant Algonquin.

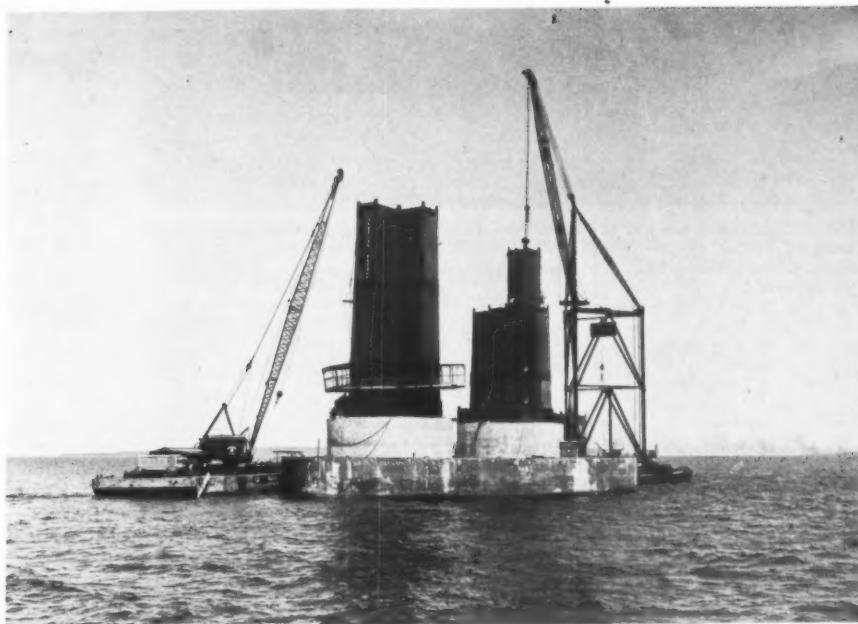
C&E Staff Photo

CONTRACTORS AND ENGINEERS

happ 1956 work season opens



The floating tower derrick, a stiffleg with 90-foot boom mounted on a 60-foot triangular steel tower, sets a base plate for one of the suspension bridge towers on pier 19. C&E Staff Photo.



With base plates set on pier 20, the tower derrick sets a segment of the tower. After completing three lifts, it will move out. The Manitowac 3900 barge-mounted crawler crane, left, will then begin erecting a working platform between the tower legs. C&E Staff Photo

Superstructure's towers, cable bents, backstay spans erected; contractor starts spinning main suspension cables this year

by RALPH MONSON, field editor

With its graceful towers topping out at a height of 552 feet above water, cable bents in place, and backstay spans running between cable anchorages and cable bents erected, the Mackinac Straits Bridge was just beginning to take shape as ice and cold put a stop to work in December, and the 1955 construction season closed. The bridge is scheduled to be opened to traffic by November, 1957, and a full program still faces the contractors.

On completion of the substructures for the two main tower piers by Merritt-Chapman & Scott Corp., New York, N. Y., last season, erection of the superstructure was started by the American Bridge Division of United States Steel Corp. Its \$44,532,900 contract for the furnishing and erection of the 68,000-ton superstructure is reported to be the largest single contract ever received by the corporation.

Tests confirm design

Even as the substructure work moved to completion and work began on the superstructure, scientists at the Suspension Bridge Laboratory at the University of Washington were making wind tunnel tests on a large dynamic model of the bridge. The results showed that the bridge has complete stability at wind velocities far in excess of any that might conceivably occur. Aerodynamically, it is the most

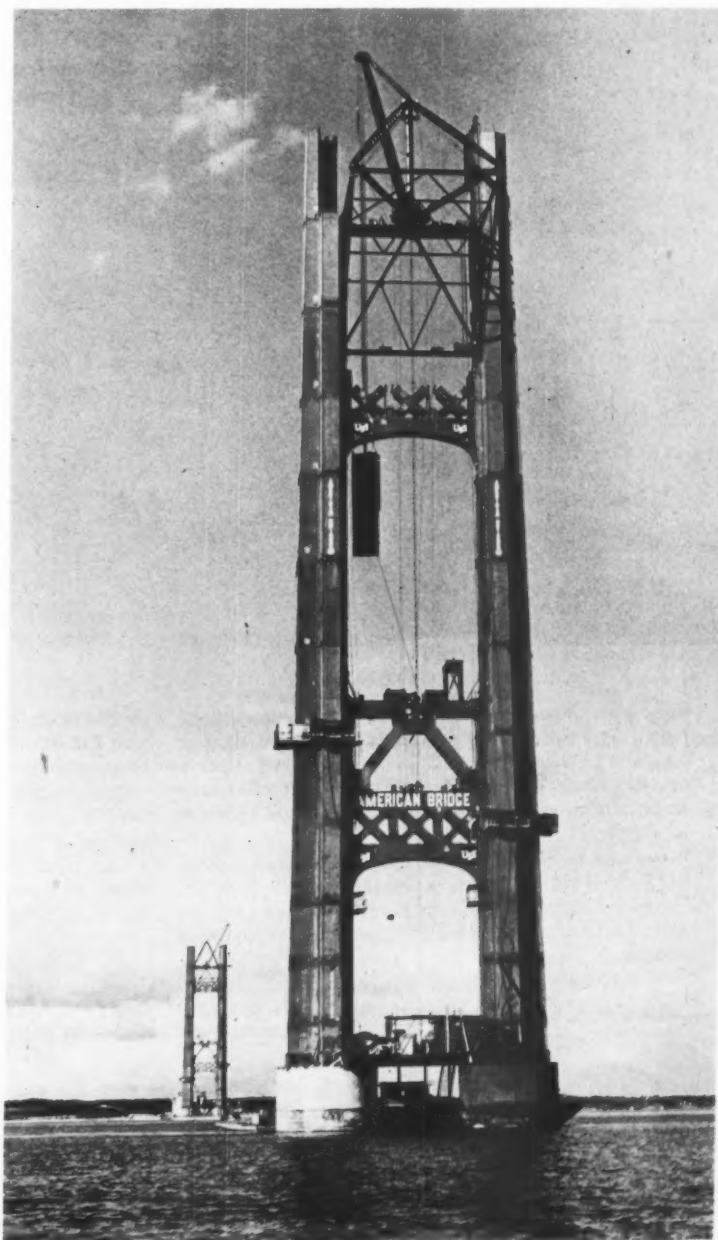
stable suspension bridge designed. Tests showed that dangerous oscillations began only when wind velocities approached the speed of sound in the 1,000-mph range. The maximum recorded wind velocity at the site is 78 mph.

Dr. D. B. Steinman, the designer, points out that this aerodynamic stability—ten times greater than that of other notable suspension bridges—was attained by scientific design of the cross section. This design eliminates the cause of aerodynamic instability without the need for adding tons of weight and spending millions of dollars on the bridge to build up its weight and stiffness.

The outstanding feature of this design is the provision of wide open spaces between the stiffening trusses and outer edges of the roadway. The bridge trusses are spaced 68 feet apart and the roadway is only 48 feet wide. This leaves 10-foot-wide open spaces along the entire length of the bridge. The design also provides what is equivalent to an opening along the center line of the bridge: two outer traffic lanes have solid floors while the two inner lanes and the center mall have open-grid floors.

Maximum stability against torsional oscillation has been achieved by providing two systems of lateral bracing, located in the top and bottom

(Continued on next page)



A section for the twelfth lift on the south tower is hoisted into place by an S1 derrick. A similar derrick permits construction to be done simultaneously on the north tower.



The north backstay span, a 468-foot 750-ton self-supporting span, is towed toward piers 21 and 22, at right. With the exception of part of the floor system, north and south spans, running from cable anchorage piers to cable bents, were erected at the dockside.

(Continued from preceding page)

chords of the stiffening trusses. This is a feature that was recently added to the Golden Gate Bridge at a cost of \$3.5 million.

The newly erected towers actually had a preliminary test November 16, 1955, when a severe windstorm hit the Straits. The wind tower holding the weather instruments at the bridge site was blown down after recording southwest winds of 60 to 65 mph and gusts up to 70 mph. Records of the U. S. Coast Guard showed that gusts later went to 76 mph repeatedly.

But the partly completed bridge, including the two towers on the main piers and the rest of the bridge piers, were undamaged by the storm. Most of the huge fleet of construction

equipment, moved to safe harbor, was protected throughout the storm, though a floating derrick was damaged when it broke loose and grounded and two welding machines and a pump were washed off pier 22.

Tower derrick sets steel

Each of the two steel towers, rising 515 feet above the concrete, is made up of two legs tied together by four struts or diaphragms. One diaphragm is located below the roadway, one is at the top of the tower, and the other two are spaced between. Each tower leg was built up of 15 vertical divisions, each of which was erected in four sections. Each of these four sections was built up, in honeycomb fashion, of plates and angles.

In section, each leg has the shape of a cross with one short arm. In all cases the short arm faces the inside of the tower to form the vertical inner face of the tower leg. The other three arms of the cross vary in length as the tower tapers from top to bottom. At the bottom, each leg measures 25 x 30 feet over-all. At the top, each tapers to 15 x 14.5 feet.

The first vertical section of each leg was made 16 feet high and the next two sections, 23 feet high. The weight of these three sections had to be held within the lifting capacity of the tower derrick handling erection. The remaining sections were subassembled into units from 31 to 42 feet high weighing up to 80 tons. These were erected by an S1 stiffleg derrick mounted on the tower legs.

Subassemblies were fabricated at American Bridge plants and shipped to St. Ignace by rail. At the dock, a Browning locomotive crane transferred them to barges for transfer to pier locations. Units arriving in St. Ignace before the erection date were unloaded and stored beside a railroad siding.

On July 2, 1955, as soon as M-C&S had completed the concrete substructures of the main tower piers, the tower derrick handling erection set the base plates for the north tower on pier 20. Then the rig set the first three vertical lifts of the tower legs before moving to pier 19 for a similar operation.

The floating tower derrick consisted of a stiffleg derrick with a 90-foot boom, mounted atop a triangular steel tower 60 feet high. The tower was supported on a float made up of two 26 x 100-foot barges welded together to form a 52 x 100-foot unit. Operating the derrick as well as the anchor lines were two Clyde three-drum hoists powered by Murphy diesel engines. The capacity of the derrick was 52 tons at 60 feet over the end of the float and the same weight at 45 feet over the side.

As soon as this rig had placed the first three vertical lifts of the tower legs on pier 20, it pulled away and a Manitowoc 3900 crawler crane mounted on a 35 x 110-foot barge moved in with a load of steel that was to make up the working platform between the tower legs at the base of the tower. This deck or platform carried three hoisting engines,—one for operating the S1 derrick that erected

Jets are coming...

is your airport ready

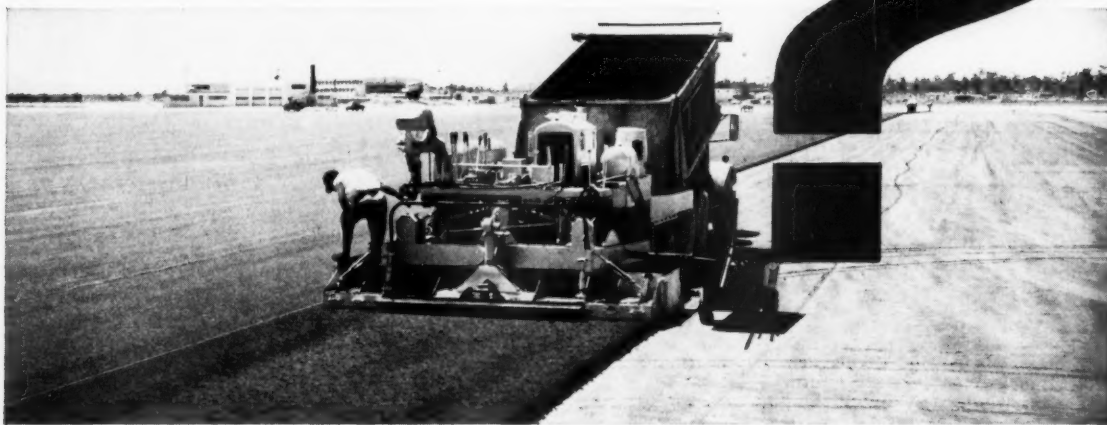


Photo courtesy Blaw-Knox Co.

Keep your city on tomorrow's mainline airways map! Start preparing *now* for the new jet transports major airlines soon will be flying. **HOW?** By *resurfacing* your airport's paving to resist the heat of jet blasts...the deteriorating action of slow-evaporating jet fuel...the weight of larger jet airliners.

Ways and means available. Recent legislation providing Federal aid to airports makes it financially possible. Tar-rubber surface courses containing Naugatuck's SURFA-AERO-SEALZ synthetic rubber ingredient make it physically possible.

When you use SURFA-AERO-SEALZ to resurface your parking aprons, taxiways and runway ends, you'll be follow-

ing the example of the U.S. Corps of Engineers in paving such Air Force Bases as Davis-Monthan, Dow, Goose Bay, Dover and Homestead...all built to withstand the punishment inflicted by heavy jet bombers!

Free booklet. An analysis of both the problem and the solution of preparing airports for handling jet-propelled aircraft is contained in a new booklet, "Jet Aircraft Pavement." We'll gladly send a free copy to any official or paving contractor concerned with airport maintenance.

Surfa-Aero-SEALZ



United States Rubber

Naugatuck Chemical Division

Naugatuck, Connecticut

BRANCHES: Akron • Boston • Chicago • Memphis • New York • Phila. • Mfg.: Los Angeles • Gastonia • Naugatuck • CANADA: Naugatuck Chemicals, Elmira, Ont. Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latexes • Cable Address: Rubexport, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 265

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the remainder of the tower, one for hoisting men, and one for jumping the S1 derrick as it climbed the tower.

The south tower on pier 19 was started as soon as the tower derrick was finished with its work on the north pier. Erection of both towers was carried on simultaneously since each carried an S1 derrick. These were stiffleg derricks with 100-foot booms, supported on structural steel frames attached to the structural steel tower legs. As tower legs went up, the derricks were jumped up until they were working on the tops of the towers. The south tower was topped out October 31, 1955, and the north tower on November 11.

Spans floated into place

While the towers were being assembled, the two backstay spans, carrying the roadway from the cable anchorage piers to the cable bents, were being assembled in the harbor. Supported on two barges, these 468-foot self-supporting truss spans were completely assembled at the dockside, except for a part of the floor system. Then the 750-ton spans were towed out to their respective locations and set in place. The south span was placed on November 19 and the north span on December 18.

Start of 1956 work

Because of the severe weather during November and December, the stringing of the catwalk cables was deferred until the start of operations this spring. These 2 1/4-inch-diameter cables will support the catwalks that workmen will use in spinning the big suspension cables this summer. The catwalk cables will later be taken down and cut into short lengths to form the bridge suspender cables that will hold the roadway trusses suspended from the main cables.

Meanwhile a Vaughn 6-spindle wire block machine at the Trenton works of the American Steel & Wire Division of U. S. Steel has been drawing the 41,000 miles of 0.196 high-tensile steel wire that will form the two main cables. Each cable, consisting of 12,920 strands of the 0.196 bridge wire, will be wrapped with a cover of lower-tensile galvanized wire. The two 24-inch main cables will weigh approximately 12 million pounds each.

Early in summer, this wire will be assembled at the bridge site and the spinning crew will begin the on-the-site job of fabricating the many strands into the two huge cables. At the same time, other American Bridge crews will be assembling and erecting the truss spans that make up the approaches to the suspension portion of the bridge. Work on these approaches will continue through the next two seasons so that the spans will be ready to carry traffic by the time the suspension portion is complete.

Personnel

The big job of supervising the superstructure contract is in the hands of project manager D. C. Kline. Superintendents of the structural steel erection operations are Fred Robinson and C. M. Haney. Representing D. B.

Steinman and the Mackinac Bridge Authority on the project is resident engineer J. W. Kinney. Chairman of the Mackinac Bridge Authority is Prentiss M. Brown.

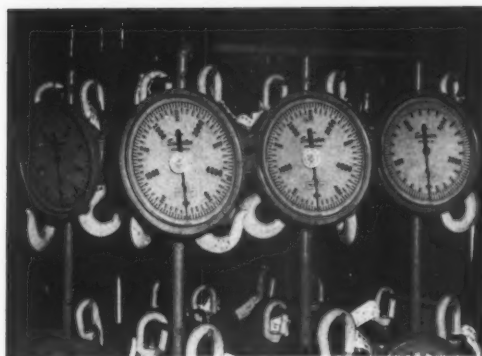
THE END

Barricade light

■ The Flasher barricade safety light that is said to be good for 30 days or more of continuous flashing is the subject of a folder from R. D. Fageol Co. The light, Model M-2, has a zinc-alloy head with a 4-inch optical plastic lens. It is claimed that the light is visible for over a mile.

To obtain this folder write to R. D. Fageol Co., P. O. Box 328, Kent, Ohio, or use the Request Card at page 18. Circle No. 7.

MARTIN - DECKER'S SU-20 SENSATER hook scale has been approved for certification by the State of California Bureau of Weights and Measures. According to the manufacturer, this is the first time that a hydraulic hook scale has been judged accurate enough to be certified by any state agency. The SU-20 Sensater is manufactured in four models with capacities from 2,500 to 20,000 pounds. For further information write to Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., or use the Request Card at page 18. Circle No. 123.



Allis-Chalmers

model **D**

THE LOW-COST MOTOR GRADER
THAT OFFERS

more of everything...



more PRODUCTION-BOOSTING FEATURES

Choice of Allis-Chalmers engines

GASOLINE — 50 brake hp. Bare grader weight — 8,800 lb. Four forward speeds to 25.6 mph, one reverse to 3.3 mph.

DIESEL — 50 brake hp. Bare grader weight — 9,350 lb. Four forward speeds to 25.2 mph, one reverse to 3.2 mph.

ROLL-AWAY moldboard rolls the load instead of pushing it, moves more dirt, uses less power.

Plus one-piece tubular frame, tandem drive, real operator comfort, hydraulic blade lift.

USEFUL OPTIONAL FEATURES

Power circle turn for faster, easier, better control of blade... turns 135 degrees.

Leaning front wheels with heavy-duty axle, for better control in close quarter-work.

Hydraulically shiftable moldboard to speed work around obstructions. Shifts 16 in. each way.

Special large tires for added traction, long wear. Front (7.50-20 or 8.25-20) and rear (8.25-20).

more JOB-MULTIPLYING ATTACHMENTS

Hydraulic scarifier, mounted amidships for maximum effective ground pressure.

Shoulder maintainer for safe, one-pass operation. Also available: one-pass windrow eliminator.

Rear-mounted 3/4-yd loader for fast, low-cost handling of materials.

plus snowplows, completely enclosed standup cab, hydraulically operated mower.

more SATISFIED USERS

Since its introduction in 1949, thousands of satisfied owners have proved the usefulness and low-cost versatility of the Model D on all kinds of construction and maintenance.

Call your Allis-Chalmers Construction Machinery Dealer for a demonstration today!

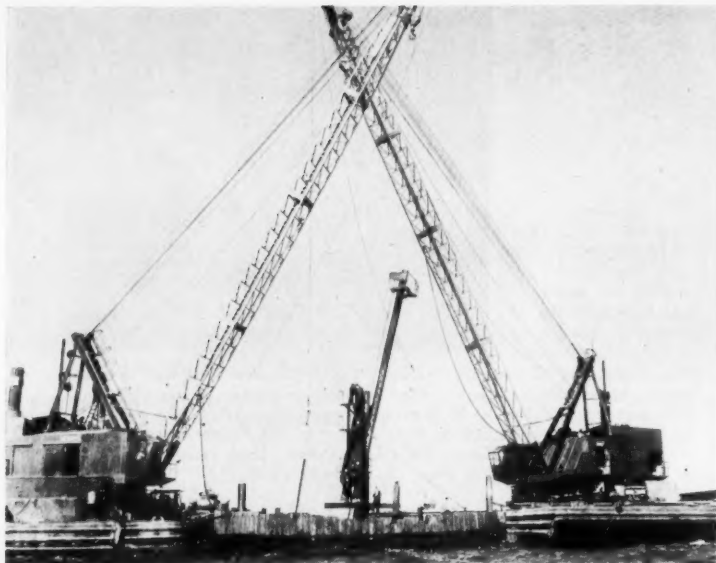
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ALLIS-CHALMERS



ROLL-AWAY is an Allis-Chalmers trademark.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 266



A special device designed to drive batter piles deep under water is handled by two American Revolver derrick barges. Driven to bearing in solid rock inside the cofferdam, the piles are in concentric rows with various batters. C&E Staff Photos

(Continued from page 72)

Mackinac Bridge will provide a four-lane highway connection between Michigan's upper and lower peninsulas. Until this time, the only crossing had been by ferry.

Thirty deck truss spans will lead from both shores to the suspension spans which bridge a deep gorge near the middle of the straits. The 3,800-foot main suspension span is second only to that of the Golden Gate Bridge, and the 8,614-foot over-all length of the suspension bridge from out-to-out of anchorages makes it the world's longest suspension bridge.

Designed by D. B. Steinman, New York, N. Y., the bridge is being built for the Mackinac Bridge Authority, an agency of the State of Michigan. A bond issue of almost \$100 million to finance the project will be repaid from tolls. The general contractor for the substructures is Merritt-Chapman & Scott Corp., and the superstructure is being built by the American Bridge Division of United States Steel Corp.

Started in the spring of 1954, the project is scheduled for completion in 1958, although the roadway is expected to be opened to traffic in November 1957.

Concrete placed under water

Underwater concrete for the 34 big piers was placed within caissons and cofferdams. (See "Substructure work starts long suspension bridge", C&E, January, 1955, pg. 26.) Cofferdams for all except three of the piers consisted of steel sheet piles driven around prefabricated steel frames. Excavation within some of the cofferdams was carried down to solid rock. Others have concentric rings of steel H-piles driven to refusal in the rock bottom of the straits.

Tower piers and the south cable-support pier were formed with steel caissons sunk through water and overburden to the solid rock below. Two of these were hollow cylindrical caissons with open dredge wells. None

of the cofferdams or caissons was underwater to place the concrete.

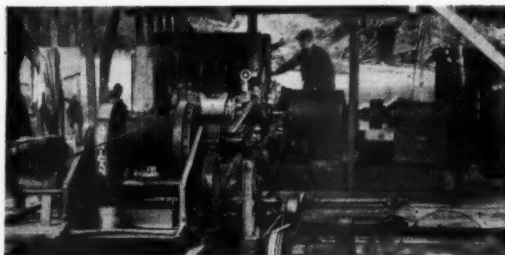
Once the cofferdams or caissons were in place and the excavation completed or piling driven, the concrete-placing operation, similar for all piers, was started. Coarse aggregate was shipped from Drummond Island, about 50 miles northeast of the bridge site, in self-unloading steamers. Carrying about 12,000 tons of aggregate, these boats tied up beside the caissons or cofferdams and discharged complete loads into the foundations for the piers.

Intrusion mortar, a cement-Alfesil-sand grout, pumped in through grout pipes, filled the voids of the coarse aggregate and consolidated the mass into solid concrete. By this Prepakt method, approximately 60 per cent

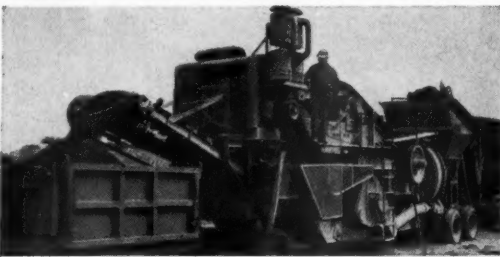
of the total concrete volume goes directly into the piers without passing through the concrete plant, explaining, in part, how the relatively small floating concrete plant was able to establish such outstanding production records. The Prepakt Concrete Co., Division of Intrusion-Prepakt, Inc., Cleveland, Ohio, was subcontractor to M-C&S on concrete placement.

Floating concrete plant

Completely self-contained on a 50 x 135-foot steel barge with a 10-foot draft, the Algonquin carries an impressive array of equipment. At one end of the barge is a Butler batching plant where the cement, Alfesil, and sand are proportioned. The three-compartment bins hold 14 tons of cement, 11 of Alfesil, and 16 of sand.



PRODUCTION DOUBLED—FUEL COSTS CUT 33½%
When Clark & Sons Sand & Gravel Company switched to a GM 2-cycle Detroit Diesel properly engineered for this dredge, production jumped more than 200% and fuel costs dropped one third. GM Detroit Diesel weighs half as much as engine it replaced, starts easier, too.



FUEL COSTS \$1.18 PER HOUR

And that's "mighty cheap" for a 300-H.P. engine according to Charles Bartelma, Superintendent of Minnesota's Kimmes Construction Company. This GM Detroit Diesel-powered Cedarapids crusher produces 4,200 tons of gravel a day—engine has had no repairs in 2½ years.



PRODUCTION UP 30%—FUEL COSTS CUT 40%

When Calumet Paving Company switched to a GM Detroit Diesel on this paver they got an engine that "starts easier, performs better, costs less for fuel and maintenance." Company also operates two other pavers and three crawlers—all GM Detroit Diesel-powered.



15 YEARS' SERVICE AND STILL GOING STRONG

The GM Detroit Diesel in this Koehring shovel went to work for Paul Frank, Inc., in 1941—is still giving "economical, trouble-free service." Owner calls engine an "excellent investment, considering low first cost, operating economy and long life between overhauls."

For Lower Costs of SPECIFY GM In ALL Your



OPERATES 20 GM DETROIT DIESELS

Ohio road-builder A. J. Baltes, Inc., operates 20 GM Detroit Diesel engines powering shovels, cranes, draglines and other equipment. Company specifies GM Detroit Diesel power when ordering new equipment—also replaces other engines with GM Detroit Diesels to get "the fundamentals needed for economical operation—performance, economy and service availability."

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GM DETROIT DIESEL POWER

Construction Equipment

YOU CAN HANDLE every construction job from first cut to final paving—and handle it at less cost—with General Motors Detroit Diesel-powered equipment.

Shovels, scrapers, compressors, graders—machinery for over 1,000 applications made by more than 150 manufacturers—are powered with GM Detroit Diesel engines, America's first choice Diesel.

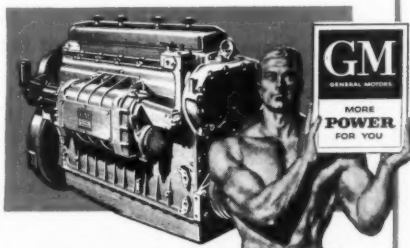
This compact, brawny work horse costs less to buy than other Diesels of comparable horsepower.

Costs less to run because its snappy 2-cycle operation gives faster acceleration, faster digging and hauling, more work done per shift.

And it costs less to maintain, too. Parts cost less. Valves, cylinder liners cost less than similar parts for other Diesels.

For full details on GM Detroit Diesels—and the equipment they power—call in your local GM Detroit Diesel distributor or write direct.

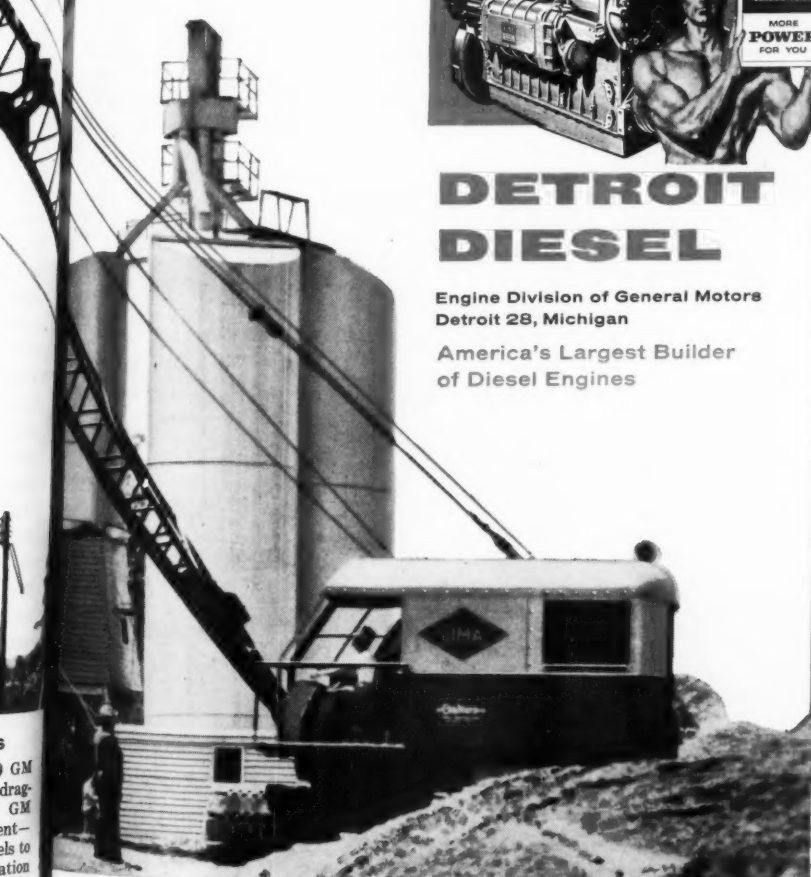
Single Engines... 30 to 300 H.P.
Multiple Units... Up to 393 H.P.



DETROIT DIESEL

Engine Division of General Motors
Detroit 28, Michigan

America's Largest Builder
of Diesel Engines



At the south anchorage pier, two American derrick barges clam aggregate into forms for a lift. The Bay City crane mounted on top of the trestle enables work to go on when water in the straits becomes too rough for the floating rigs.



Unloading rock from lake steamers to small above-water piers was difficult, so rock was stockpiled in a shallow area first. An American R-15 with a Wellman bucket dumps it to a screening and washing plant before it is barged to piers.

Parts and Service

When and Where You Need 'em

Back of GM Detroit Diesel performance stands a national network of 165 GM Detroit Diesel distributors and dealers.

They're ready to supply you with factory-engineered parts where and when you need them.

They're ready to send factory-trained servicemen speeding to your job day or night—men with all the skill and know-how it takes to keep your GM Detroit Diesels running right.

And they're ready to fill your every power need whatever it is—from a complete new engine to a minor replacement part.

When you get replacement parts from your GM Detroit Diesel distributor or dealer you're getting factory-engineered parts built to the same high quality standards—by the same precision methods—as the parts used in building GM Detroit Diesel engines.

You get parts with every improvement advanced engineering has developed because only GM Detroit Diesel parts have all the improvements originated by GM engineers at Detroit Diesel.

And you get longer-wearing parts that have been proved in billions of hours of service on the toughest jobs.

For full details on the parts and service behind GM Detroit Diesel performance, call in your local GM Detroit Diesel distributor or dealer. He's listed in the Yellow Pages—or write direct for the name of the distributor nearest you.

Butler batching equipment weighs the materials and discharges the batch into a pair of 3-cubic-yard Intrusion grout mixers, just under the bins. The mixers are manufactured by Concrete Transport Mixer Co., St. Louis, Mo. A typical 2.78-cubic-yard batch for the Class B underwater concrete included:

Cement	1,925 pounds
Alfesil (fly ash)	1,230 pounds
Sand	5,115 pounds
	(100% Passing No. 8)
Intrusion Aid	35 pounds
Water	1,890 pounds

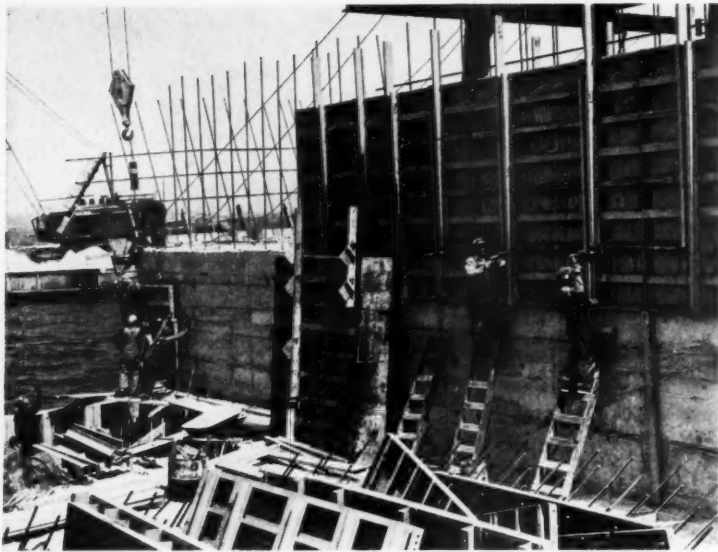
From the mixers, the grout is discharged through rotating screens to agitators which act as surge tanks to keep the grout pumps continuously supplied. Four of the six Gardner-Denver Model FD grout pumps mounted on the deck beside the concrete plant are usually operating at the same time, with the remaining two standing by. The pumps force the grout through 2-inch hoses branching into two 1¼-inch grout pipes. Spaced at 10 to 20-foot centers throughout the pier, the pipes extend to the bottom of the aggregate which has been placed. As the voids are filled, the grout pipes are raised until the mortar reaches the top of the rock.

Sounding wells of long flat sheets, bent into a circular section with a continuous open slot, extend from the surface to the bottom of the pour. As the mortar is placed, it enters the small opening or slot in one side of the sounding well. By dropping a weight into the well, it is possible to determine the exact elevation of the mortar at various points in the pier. Pumping through the tubes is regulated to maintain a uniform grout elevation throughout the entire pier.

Handling equipment for cement and Alfesil is also on the Algonquin. These two ingredients of the mix are delivered to the Algonquin by four special steel barges. Cement is unloaded from the barge and transferred to the bin of the plant by a Fuller-Kinyon cement pump, electrically operated by remote control to feed the cement through a screw conveyor to a 5-inch cement tube. Air forces cement through the tube to the bins.

Alfesil is unloaded from another compartment of the same barge by a Fuller Airveyor which operates like a giant vacuum cleaner to pick up

For more facts, use Reader-Reply Card opposite page 18 and circle No. 267



Workmen set the Blaw-Knox steel forms for another lift on one of the cable anchorage piers.

the fly ash and deliver it to the hopper. In the powerhouse of the Algonquin is a pair of Fuller-Kinyon compressors which provide the air for these operations. The cement-handling equipment utilizes a C70 compressor, while a C120 handles the fly ash. Also located in the powerhouse are a pair of Ingersoll-Rand Gyro-Flo 600 cfm compressors and five Murphy 100-kw diesel generator sets. Two additional compressors, a Joy 650 cfm and an Ingersoll-Rand 600 cfm, are mounted on the rear deck outside the powerhouse.

An American R-15 Revolver with an Owen 3-yard clamshell bucket, mounted on the rear deck, keeps the sand bin filled. Sand is delivered to the Algonquin in flat-bottom open scows. The Algonquin usually works with its front end nosed up to the pier being filled, while a cement-Alfesil barge ties up on one side, and a sand barge on the other.

Rated capacity of the Algonquin is 100 cubic yards of grout per hour. With the grout representing approximately 40 per cent of the total concrete volume, it is possible to place about 250 cubic yards of concrete per hour, a rate that actually was exceeded for a complete 24-hour day, all lost time included, when the record of 6,250 cubic yards per day was established. During the best month of operation, the Algonquin averaged 3,197 cubic yards although it operated only 28 out of 31 days.

Cement, Alfesil, and Intrusion-Aid were loaded into barges at a specially built dock at Mackinaw City on the south side of the straits. Cement was delivered to the dock in Gramm self-unloading trailers and semitrailers pulled by Mack trucks. Link-Belt screw conveyors and elevators carried the cement from the trailers to the cement barges tied up beside the dock.

Alfesil, a special fly ash, arriving at the docks in bottom-dump rail hopper cars from the Detroit Edison plant at Trenton, Mich., was transferred to the barges by Link-Belt equipment similar to that used for the cement transfer. Intrusion-Aid additive for the grout was shipped by

rail from Prepakt Concrete Chemical Co., Cleveland, Ohio, in bags containing approximately 35 pounds. At the dock, these bags were placed on pallets which were loaded onto the barges by a crane.

Sand was usually delivered to the job site in self-unloading boats and transferred to sand scows. When the scows were unable to take the complete load, the excess was stored in an old lake steamer, the Wolverine, anchored near the job. As this sand was needed, one of the derrick barges moved over and clammed it from the hold of the Wolverine to the sand scows.

Prefabricated steel forms

Underwater concreting was carried up to an elevation of 11 feet below

the normal water surface. From this point, several shapes of Blaw-Knox steel forms were used to construct the piers. Columns of the tower piers were built with self-supporting steel cylindrical forms. Similar forms shaped the smaller, but taller, cable-rest piers.

The big cable anchorages measuring 135 x 115 feet in section at the water's surface, were made with standard Blaw-Knox wall forms with 7-foot 10-inch lifts. On all except the two cable anchorage piers, the forms were set and moved by one of the derrick barges. Forms for the two anchorages were handled by special cranes carried on trestles on the piers.

Steel trestles were erected on each of the cable anchorages extending from about water level up to about

With Kwik-Mix R-15
Moto-Bug® you get

3 TOOLS IN ONE

15 cu. ft. hopper body — Big-capacity R-15 Moto-Bug hauls concrete, plaster, mortar, brick, tile, and any other construction materials or supplies you shovel, pile or stack into the gravity-dump hopper. It carries up to 2000 pounds or 15 cu. ft. of bulk materials each load — takes a full batch of concrete from an 11-S mixer. Gravity dumping is instantaneous, or can be snub-line controlled.

2000-pound platform — Change from hopper body to platform, and you have a heavy-duty, 1-ton capacity truck for hauling concrete blocks, stone slabs, sacked cement and other bulky materials. Moto-Bug platform has a load area of 34 x 54 inches, and is equipped with stake pockets for sideboards. Platform tilts for unloading—has same gravity-dump principle as hopper body.

7-foot fork lift attachment lets you use the R-15 Moto-Bug for lifting, loading and unloading. It's readily interchangeable with hopper or platform — lifts 1500 pounds to 7-foot height. Hydraulic power raises and lowers load. Mast can be tilted back 10° when carrying load — or 2° forward for pick-up or releasing load. Forks are 24 to 30 inches long — adjustable 6 to 32 in. wide.



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Send no literature enc. ☐ R-15 Moto-Bug ☐ S-10 Moto-Bug
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one half the height of the finished pier elevation, or about 50 feet above the water. Final height of the anchorages is 118 feet above water. These trestles, the length of the piers, were topped with timber decks. A Manitowoc 2000 crawler crane was set on the north-pier trestle, and a Bay City motor crane was mounted on the trestle on the south cable anchorage pier. The 75-ton derrick barge Cherokee, a Wiley Whirley crane, picked these small cranes off barges and set them on the trestles. Only the booms were detached when the cranes were being set or removed.

Once the cranes were mounted on the piers, form erection continued regardless of weather conditions. As the concrete of the piers was poured, the trestles were encased and became

a part of the pier.

Since the above-water concrete pours were usually smaller than the underwater pours and the placement of aggregate was more difficult, aggregate was placed by floating derricks and clamshell buckets rather than being unloaded directly from the lake steamers.

A relatively shallow area of the straits near the St. Ignace shore was selected for a stockpile, and the self-unloading rock boats dumped their 10,000-ton loads in a pile which sometimes extended high above the water and was sometimes awash. When the rock was taken from the stockpile, it was rescreened to remove the minus- $\frac{3}{4}$ -inch material. One of the floating derricks clammed the rock from the stockpile to the barge-mounted



The two workmen at the right, on the Mackinac substructure job, check grout level by sounding in an open well. As the grout level rises, the pipes are raised until mortar reaches the top of the rock. The workman at the left controls the flow of grout through the pipes.

C&E Staff Photo



R-15 Moto-Bug travels 6 m.p.h. forward and reverse, has automotive-type brakes. Clutch lever and brake pedal are within easy reach of seated operator. There's 18 to 1 gear reduction ratio on steering wheel. Turning radius is only 30 inches — overall width, 35 inches. It is powered by 8.3 h.p. gas engine (electric starter optional). There's a choice of pneumatic tires or solid-rubber, soft-core tires. Dual drive tires are optional, give extra traction, flotation, stability for work on or off pavement.

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3-tool usefulness is available in 2 sizes of Moto-Bugs



S-10 Moto-Bug — For smaller jobs, Kwik-Mix also brings you 3-tool versatility in a 6 h.p. Moto-Bug. This S-10 model has 10 cu. ft. capacity as a power wheelbarrow — 1500-pound load capacity as flatbed truck — and 1000-pound (6-foot) fork lift attachment, all interchangeable. Operator rides on rear step — has safe, automatic "deadman" brake control. A small investment in Moto-Bug can earn big savings in time and labor on your work. Check on both sizes — see your Kwik-Mix distributor or write us.

Dig 6 feet wide with 310 Trenchliner®

Equipped with dual booms, big-capacity 310 Trenchliner digs 6-foot trench at depths to 12 feet. With single boom it has 1½ to 4½-foot widths, and 17-foot maximum depth. Digging speeds range from 5 inches to 20½ lineal feet per minute. Power-shift spoil conveyor discharges to either side of machine. There's full reverse of all operations for undercutting, making vertical set-ins. Parsons line also includes 4 smaller heavy-duty trenchers.

PARSONS • Newton, Iowa
(Koehring Subsidiary)



Lo-Bin® for batching or transit-mix

As a batch plant, Johnson Lo-Bin can be arranged with 2, 3 or 4 aggregate compartments. For transit-mix, one compartment can be used for bulk cement. It has 22 or 44 cu. ft. batcher, up to 4 weigh-beams. Batchers ride out beyond end of bin, dumps onto conveyor, or mixer skip (serves 6-S to 28-S mixers). Lo-Bin has 8, 20, 30-ton capacity, is only 7½ to 9½-ft. high — easily charged by tractor loader. Optional: wheels, tires, tow-bar.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)



86.7 batches per hour with 34-E twinbatch®

Koehring 34-E paver hits a top output of 86.7 batches per hour (60-second mixing time). This reserve work capacity offsets normal production delays . . . assures an average of 50 batches an hour, 8 hours a day, at no increase in batching, hauling or finishing equipment. Every mixing operation is automatic, accurate, fast with split-second Autocycle control. Get more facts on big Koehring 34-E twinbatch. Also check rubber-tired 16-E.

KOEHRING Company
Milwaukee 16, Wis.



screening plant, and as the screened rock discharged from the plant, it poured onto flat-bottom barges moored alongside.

Rock was towed to the pier forms on barges and was bailed into the forms by one of the floating derricks using clamshell buckets. Once the lift of aggregate was in place, intrusion mortar was pumped into the voids by the same method used in the underwater pours. All concrete on the piers was placed in this way.

Mortar for the pours above elevation minus-10 contained a higher percentage of cement with less fly ash and sand than the underwater mix. Instead of the 2.5 to 2 to 6 ratio of cement, Alfesil, and sand used in the underwater concrete, the upper portions were mixed in the ratio of 3 parts cement to one part Alfesil to 4 parts sand.

Add second concrete plant

A second, smaller concrete plant, now being held as a standby, will be used in 1957 to finish the foundation concrete of two main anchorages. Known as the Prepakt Junior, this rig is a complete barge-mounted plant, smaller than the Algonquin but similar to it in many ways. The Butler twin-batching plant with a three-compartment 31-cubic-yard bin for cement, Alfesil, and sand weighs out batches and discharges to a pair of Prepakt 1-yard mixers. The mixed grout is fed through a Prepakt rotating screen to an agitating surge tank. Three Gardner-Denver Model FG grout pumps take material from the agitator and pump it through hoses and pipes to the forms.

The electrically operated plant is powered by a pair of Murphy diesel generator sets with 100-kw EM generators. Grout pumps and other air-operated equipment are supplied by a pair of Ingersoll-Rand Gyro-Flo 600-cfm compressors. A Manitowoc 2000 crane mounted on the rear of the barge charges the sand bin from sand scows moored alongside.

Another great difference between the Prepakt Junior and the Algonquin is the method of handling the cement and Alfesil. The Prepakt Junior uses U. S. Sealdbin 70 rubber containers for handling the bulk cement and Alfesil. These containers, holding 70 cubic feet each, are loaded from spe-

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 268

cial hoppers on the dock, placed on barges by an American railroad crane, and hauled to the concrete plant. Here the crane on the barge picks them up and sets them over the openings of the plant bins. When a valve in the bottom of the container is opened, the material drops into the bin of the plant, and the Sealdbin is returned to the dock for another load.

With the multimillion-dollar fleet of floating equipment working on a round-the-clock schedule when weather permitted, 92.64 per cent of the substructure contract was completed by early November. Erection of the steel superstructure by American Bridge Division started off well this year with the tower at pier 19 erected to full height of elevation 540, except for the pier saddles. The tower

for pier 20 was one tier behind pier 19 and was erected to elevation 498 when the job closed for the winter.

American Bridge Division planned to float out the first span in the latter part of November. The 468-foot first span weighs about 750 tons and is the south backstay span. It was erected on falsework on scows in St. Ignace.

To carry on the work at this rate, the substructure contractor, M-C&S, had nearly 800 men on the payroll. Supervising the operation for Merritt-Chapman & Scott Corp. was project manager G. C. Denny, who was assisted by project engineer C. E. Haltenhoff. Superintendent for the Prepakt Concrete Co. on the concrete-placing operations was M. M. McKinzie.

Representing D. B. Steinman is

J. W. Kinney, resident engineer, and the principal associate engineer, Walter E. Joyce. Chairman of the Mackinac Bridge Authority is Prentiss M. Brown.

THE END

THE BRIDGE AT MACKINAC

*In the land of Hiawatha,
Where the white man gazed with awe*

*At a paradise divided
By the straits of Mackinaw,—*

*Through the depths of icy water,
Battling tides around the clock,
Men are dredging, drilling, blasting,
Driving caissons down to rock.*

*Fleets of freighters bring their cargoes
From the forges and the kilns;
Stone and steel—ten thousand barge-loads—*

From the quarries, mines, and mills.

*Now the towers, mounting skyward,
Reach the heights of airy space.
Hear the rivet-hammers ringing,
Joining steel in strength and grace.*

*High above the swirling currents,
Parabolic strands are strung;
From the cables, packed with power,
Wonder-spans of steel are hung.*

*Generations dreamed the crossing;
Doubters shook their heads in scorn.
Brave men vowed that they would build it—*

From their faith a bridge was born.

*There it spans the miles of water,
Speeding millions on their way—
Bridge of vision, hope, and courage,
Portal to a brighter day.*

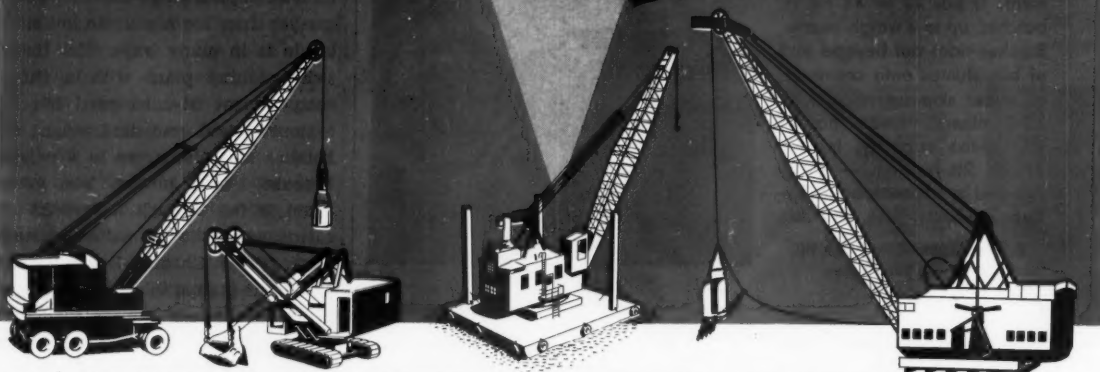
by Dr. David B. Steinman of New York City, N. Y., designer and consultant of the Mackinac Bridge.

OPERATORS OF CONSTRUCTION EQUIPMENT HAVE PROVED THAT

IT OPERATES BEST

WHEN

FAWICK-EQUIPPED



CONSTRUCTION MACHINES EQUIPPED WITH FAWICK CLUTCHES PRODUCE MORE WORK, WITH GREATER OPERATING SAFETY, OVERLOAD PROTECTION AND LOWER MAINTENANCE.

Extensive job studies have proved that FAWICK's accurate air operation and control result in increased production, less operator fatigue and less machine down-time.

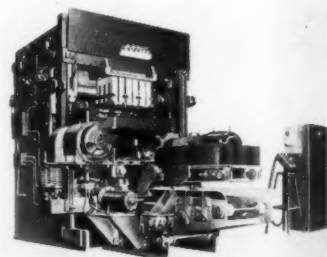
The aggressive FAWICK program of power transmission product development and the expansion of FAWICK field engineering facilities, are designed to increase your machine production and efficiency. The nearest FAWICK representative or the Home Office will show you how quickly and easily this can be done. Remember—your machines will operate *best* when FAWICK-EQUIPPED!

FAWICK AIRFLEX DIVISION
FAWICK CORPORATION
9919 CLINTON ROAD CLEVELAND 11, OHIO
In Canada: Fawick Canada, Ltd., Toronto, Montreal

Field Offices and Representatives in principal cities

For more facts, use Reader-Reply Card opposite page 18 and circle No. 269

FAWICK Airflex
INDUSTRIAL CLUTCHES AND BRAKES



A hydraulic drive is combined with a conventional vibration system in the new Gocorp Trustee block machine.

Hydraulic block machine

■ A three-at-a-time, plain pallet block machine has been announced by Gene Olsen Corp., 442 Grace St., Adrain, Mich. The new Trustee model features hydraulic drive but uses a conventional vibration system that will take, without alteration, the molds of many competitive machines. According to the manufacturer, with many aggregates the machine will produce 1,100 blocks per hour because the hydraulic drive speeds up some of the steps in the production cycle.

The hydraulic system has large single-acting cylinders throughout, and an oil pump large enough to supply an ample flow of oil without the use of accumulators.

The remote control push-button station is a separate unit easily located for maximum operator convenience. The electric panel is in a separate housing.

Attachment changes may be made in less than 30 minutes, even when changing heights; and because of the smaller number of working parts, the machine is reported to be easy to clean and adjust.

For further information write to the company, or use the Request Card at page 18. Circle No. 121.

Masonry, concrete blades

■ A mailing piece presents the Edmar break-resistant concrete-cutting blade for all wet and dry cutting operations. A chart lists blade specifications most generally applied to various materials—brick, concrete products, fire brick, stone, and tile.

To obtain this mailing piece write to The Edmar Co., 818-842 Highland Ave., Andalusia, Pa., or use the Request Card at page 18. Circle No. 57.

CONTRACTORS AND ENGINEERS

First aid station augments Mackinac Bridge safety program

With as many as 650 workmen on the Mackinac Straits bridge project—many of them doing such dangerous work as cutting and welding steel, driving piling, and placing concrete, some accidents and injuries were almost inevitable, despite the best job safety program.

To meet every possible contingency on this job, substructure contractor Merritt-Chapman & Scott Corp. had a well equipped and well manned first-aid station at the site. It not only helped treat workmen but also aided in preventing accidents by promptly treating injuries that might have hampered a workman who returned to his work without proper care.

The first-aid station, set up adjacent to the project office at St. Ignace, Mich., on the north shore of the straits, was fashioned from a discarded bus body. Painted white inside and out, and with such equipment as an examination table, X-ray machine, short-wave diathermy machine replacing its old seats, the bus made a neat and efficient station. A circulating oil-burning heater was used early and late in the construction season, and nature provided the only air conditioning required during the summer.

Manned 24 hours per day and 7 days a week during the construction season, the station provided facilities for the examination and treatment of injuries by local physicians, who were called in all emergencies. Registered nurses operated the station, treating minor injuries and non-industrial ailments.

Mobile radio helps

Since operations were spread across five miles of water, as well as being concentrated at assembly yard and docks, the 38 Motorola two-way radio units scattered throughout the construction fleet were invaluable in reporting accidents and getting help to the site. Though radio was used for first-aid calls only an insignificant amount of the total operating time, its contribution bulked large in the over-all first-aid program.

When an accident occurred in the straits, the superintendent or foreman in charge reported it immediately to the project office by radio. As soon as such a call went on the air, all other use of the radio system was suspended until calls concerning this emergency were completed.

If the injury was minor and the workman could be safely brought ashore, the nearest personnel boat was instantly dispatched to the scene.

At the same time, a telephone message went out for one of the local doctors to be at dockside, with an ambulance if necessary, when the boat arrived.

(Concluded on next page)



More than first-aid treatments are provided at the station, which bears little resemblance to an old bus. Mrs. Phyllis Tuck, RN, here operates the short-wave diathermy machine, while project manager G. C. Denny looks on.

THE HIGHWAY HEAVY-DUTY TRUCK-MOUNTED EARTH-BORING MACHINE



Modern . . . Rugged . . . Versatile . . . Efficient . . .
digs at any angle up to 90° in any soil condition — even rock when equipped with special auger...convenient controls...sets big poles

The Highway "HC" earth-boring machine is designed and built rugged and sturdy, for tough daily use. The power-operated "HC" can be quickly adjusted to dig at any angle up to 90° — auger bar and pole derrick raised from traveling to working positions by power. Light enough for mounting on a minimum 16,000-pound G. V. W. truck, the "HC" digger requires only 7 square feet of platform space. Convenient controls are easily accessible and Highway design provides complete safety for both operator and machine.

The "HC" earth borer digs holes from 9 to 36 inches in diameter, up to 10 feet deep. A 2500-lb. capacity winch and pole derrick (optional equipment) can handle 40' to 45' poles.

Exclusive!

Highway's Telescoping Derrick

The telescoping derrick, 3500-lb capacity, can be extended to more than one-half its collapsed length. Available as optional equipment on the Model "HC" machine.



**HIGHWAY UTILITY DIVISION
HIGHWAY TRAILER COMPANY**
HEADQUARTERS: EDGERTON, WISCONSIN

Manufacturers of

Public Utility Bodies • Earth-Boring Machines • Pole and Cable Reel Trailers
• Winches • Power Take-offs • Service Accessories • Commercial Trailers
• Trailerized Tanks and Dry Bulk Haulers

SALES AND SERVICE IN PRINCIPAL CITIES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 270

(Continued from preceding page)

If the superintendent thought the injured person could not be moved, the doctor was rushed by car and boat to the scene of the accident. Careful planning got this first-aid routine into operation immediately, and allowed it to be carried through without delay, complication, or interruption.

Treatment

Minor injuries—flash burns, foreign particles in the eyes, cuts, and scratches—were treated at the first-aid station by the nurse on duty. Prompt and proper treatment at this station got most of the workmen back on the job immediately and prevented serious complications later on.

The station staff and equipment had other work aside from first-aid treatment. Qualifying physical examinations of new employees were given here. Men with physical handicaps that made them unfit for the type of work being done could be singled out so they would not endanger themselves or others on the job.

A second and possibly major function of the station was to treat employees according to the recommendations of their own doctors—for non-industrial ailments as well as for injuries. A short-wave diathermy machine, heat lamps, and penicillin, and other common drugs and medicines were all available for these treatments. Through this phase of the program, employees could get relief for a wrenched muscle, sprained toe, or an aching back. And when they were made more comfortable and their recovery speeded, their job efficiency was maintained at a maximum.

Behind this first-aid program for the M-C&S spread is the corporation's physician, Dr. P. J. Imperato. He plans the programs, hires the nurses, visits the remote job installations from time to time, and provides general supervision of all related activities. Manning the station at the Mackinac bridge project were registered nurses Mrs. Phyllis Tuck, Mrs. Helen Kalmer, Mrs. Isabelle Hagen, and Mrs. Eunice Therrian.

THE END

Plastic pipe catalog

■ Plastic pipe for installation in curved trenches or where rigid pipe would require many fittings is described in a catalog from Bakelite Co. This polyethylene pipe is said to be lightweight and corrosion-resistant even when buried in acid or alkaline soils.

Nominal pipe sizes from ½ to 2 inches conform generally to ASA standards for wrought-iron and wrought-steel pipe. Topics included in the catalog are: dimensions, working pressure, coiling, extrusion, pipe sizing, and joining and fitting.

To obtain Catalog No. 3 write to Bakelite Co., Division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 118.

Salamander operates on liquid petroleum gas

■ A new line of portable liquid-petroleum gas heaters for contractors has been introduced to the construction field by Cimco of Marshalltown, Iowa.

Cimco's S-100 "Thrifty" jet salamander can be used without safety controls and unvented for outside work. Included is a U. L. approved regulator. The unit can also be ordered with any safety controls desired and with a chimney vent for heating inside jobs.

An advantage of the new salamander is that it eliminates worry over



The portable Thrifty jet salamander.

electrical plug-in connections. A worker can pick it up and carry it to

any location where heat is needed.

Four other Cimco "Thrifty" LP heaters are available, some on wheels.

For further information write to Cimco, Box 422, Marshalltown, Iowa, or use the Request Card at page 18. Circle No. 74.

Napco names head of Federal truck sales

Robert L. Wicker has been appointed sales manager of Federal Motor Truck Division of Napco Industries, Inc., Minneapolis, Minn. He will concentrate on sales of crane carriers, transit mixer carriers, etc.

the
all new "QUICK-WAY"
GREATER POWER AND CONTROL FROM BUILT-IN BALANCE

CONSTANT POWER
in the palm of your hand

"QUICK-WAY"- 50

¼ Yd. 5 Ton

"QUICK-WAY"- 80

⅜ Yd. 8 Ton

"QUICK-WAY"-100

½ Yd. 10 Ton

"QUICK-WAY"-120

¾ Yd. 12 ½ Ton

and Five new "QUICK-WAY" Carriers

THE MOST COMPLETE LINE IN THE SMALL SHOVEL FIELD

needed.
"rifty" LP
on wheels.
write to
own, Iowa,
t page 18.

of

been ap-
Federal
apco In-
Minn. He
of crane
iers, etc.



Designed for large trucks with existing air supplies, the Air-O-Steer unit can be installed in two hours or less, according to the manufacturer. ▶

Power-steering kit fits all makes of trucks

■ A power-assist steering kit for all trucks with existing air supplies is now available from the manufacturer, Air Applicators, Inc., 1522 S. E. Union Ave., Portland, Oreg.

The Air-O-Steer installation kit includes cab-control valve, valve-actuated pitman arm, axle bracket, ram, tie-rod clamp and brackets, hoses, and all necessary fittings. The valve-actuated arm is the heart of the unit. The turning steering wheel exhausts air pressure on either side, causing the ram piston to move back

and forth, thereby turning the tie rod. The system will automatically revert to manual steering should the air supply fail.

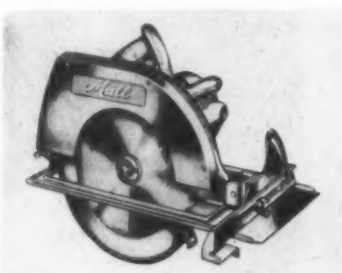
Three types of controls are available: a simple on-off system which permits, either power or manual steering; a 4-position control for varying road conditions; and an automatic control that mounts under the hood with no controls in the cab.

For further information write to the company, or use the Request Card at page 18. Circle No. 33.

Abrasive cutting saw

■ A new high speed saw specifically designed for abrasive wheels, is being marketed by The Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill.

Built for continuous operation, the Model 192 electric saw is powered by a rugged precision ball bearing ac-dc 25 to 60 cycle motor (voltage:



115—230 available). Its motor air exhaust is directed away from the cutting line, keeping sawdust at a minimum. The motor air intake is equipped with a renewable dust filter.

The saw comes equipped with 9-inch Abraso-Flex cut-off wheels, blade wrench, steel carrying case, extra air filter bath, lubricant, and a 15-foot cord with plug and ground. It is recommended for cutting steel, stone, terrazzo, non-ferrous metal, concrete and compositions.

For further information write to the company, or use the Request Card at page 18. Circle No. 126.

Portable air compressors

■ The complete line of Gyro-Flo portable air compressors manufactured by Ingersoll-Rand is pictured in a catalog available from the company. Capacity ranges from 125 to 600 cfm. These compressors operate on a 12-volt battery starting system on either gasoline or diesel engine. Pictures show the models spring-mounted on two or four-wheels with steel or pneumatic tires. Specifications are given on each model.

To obtain Form 2321-A write to Ingersoll-Rand, 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 17.

Form ties

■ A mailing piece from Universal Form Clamp Co. briefly describes Spiroloc form ties, Twisties, snapties, and form clamps. The various parts of the equipment are illustrated.

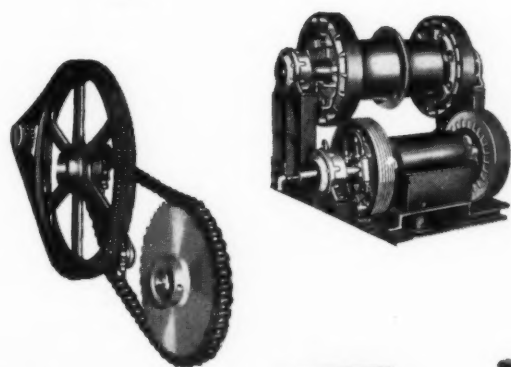
To obtain this mailing piece write to Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 10.

←Use coupon, or circle No. 271

With MORE Big Shovel FEATURES

ALL CHAIN & SPROCKET DRIVE

Machine-cut steel and cast iron sprockets with compact, high-speed, heavy-duty roller chains give positive power, reduced noise, and greater flexibility under every operating condition. Oil and dust tight cases.



MAIN ASSEMBLIES

Power up and down boom standard on all models.

High tensile steel shafting. Any one main assembly removable without tearing down others. Positive control shaft centers for 100% clutch and brake action.

AIR COOLED DRUMS

Large size, louver-ventilated, ductile iron clutch and brake drums, finned-ventilated swing assembly drums... specially designed for cool, continuous running at top efficiency.

CLUTCH CONTROLS & HYDRAULIC SYSTEM

Smooth, positive minimum-effort control from new hydraulic system. New design control lever locks.

ADVANCE DESIGN LUBRICATION

Daily grease fittings centrally located on cab panel. Intermittent grease fittings easily accessible. Positive grease and dirt seals at all revolving points. Force-feed, filtered, circulating lubrication on all chain and sprocket drives and on main shaft bearings. Main bearings also running in oil.

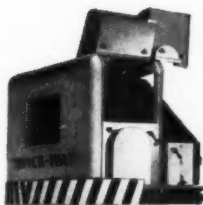
COMFORTABLE FULL VISION CAB

All operating controls, including instrument panel and lock throttle, conveniently located in front of operator. Safety glass windows on all sides and top insure full vision—sliding and hinged windows provide maximum ventilation.



HINGED PANELS FOR EASY MAINTENANCE

Hinged, fold-out panels all around for quick, easy maintenance and adjustments.



"QUICK-WAY" TRUCK SHOVEL COMPANY

Denver, Colorado

A **Pump-Tex** Subsidiary

Mail Coupon Today
For FREE Information

"QUICK-WAY" TRUCK SHOVEL CO.
Dept. 326—2401 East 40th Ave.
Denver 5, Colorado, U.S.A.

Please send complete information on the ALL NEW "QUICK-WAY" and the NEW "QUICK-WAY" carriers—check model number or numbers 50 (), 80 (), 100 (), 125 ().

Name _____

Address _____

City _____

State _____

With the Famous Money-Making Line of "QUICK-WAY" ATTACHMENTS

Shovel, Crane, Shovel, Dragline, Clamshell, Driver, Magnet, and many other tools for all types of jobs.



Here is how the vacuum-actuated lubricant pump of the new Alemite centralized lubrication system may be mounted in the engine compartment of a vehicle. The system delivers a measured shot of lubricant up to 30 bearings each time engine is started. ▶

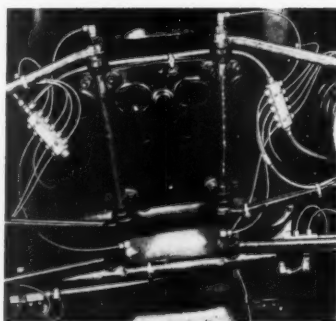
Centralized lubrication system for all powered equipment

■ A new centralized lubrication system for trucks, tractors or any equipment powered by an internal-combustion engine, automatically delivers a controlled, measured amount of lubricant to as many as thirty lubrication points or bearings each time the engine is started.

The new Alemite system consists of a vacuum-operated pump from which tubing carries the lubricant to a positive-displacement measuring valve located at every bearing. A single-line terminating system, it is energized whenever the ignition of the vehicle is turned on and the engine is started. An indicating light on the instrument panel glows while the system cycles. Failure to light indicates to the driver that there is a fault in the system—a broken line or lack of lubricant in the reservoir.

In installing the system, measuring valves are substituted for fittings at all lubrication points requiring a 1/8-inch P.T. fitting. Where drive or rivet-type hydraulic fittings are used, a measuring valve with a compression-type nut and sleeve is fastened to the hydraulic fitting.

Lubricant lines are of nylon tubing,



This is a typical installation of header blocks, tubing and valves at each bearing, part of the new Alemite centralized system.

have a 2,500 psi burst rating, and a varnished Fiberglas sleeving protects the nylon tubing from abrasion.

The vacuum pump which supplies lubricant to the lines provides 500 psi pressure at the end of the line. Positive displacement measuring valves at every bearing deliver 0.003 cubic inch of either oil or Type 0 grease.

For further information write to Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill., or use the Request Card at page 18. Circle No. 73.



Grousers: available in regular, semi, or flat types; all standard widths

WHY Kensington track LASTS SO LONG

There are two reasons why these tracks give you longer service, even under severest working conditions: (1) KENSINGTON's new, improved design, and (2) superior, wear-resisting alloyed manganese steel.

New Design. Rigidity and near-perfect alignment are made possible by one-piece rail design and special heat-treated alloy pins pressed tightly in place under high pressure. Anti-shear lugs on grouser plate fit snugly over tie bar of link to eliminate loose plates, elongated bolt holes, twisting, weaving, and side-sway... the most common causes of bolt loosening and track trouble. Grousers are heaved-up at all critical points to better resist bending and breaking.

Yet, despite all these improvements, KENSINGTON Track Assemblies fit all standard, popular make crawler tractors.

Steel with Stamina. Special, hard, tough, KENSINGTON-developed alloyed manganese steels actually fight back against wear! They constantly develop extra surface hardness when exposed to friction, abrasion, and impact.

Kensington tracks come from the factory ready-assembled, easy to install.

Discover for yourself how much KENSINGTON tracks will lower your maintenance costs and improve your operating efficiency. Coupon will bring details.



Kensington

STEEL COMPANY

SUBSIDIARY OF POOR & CO., CHICAGO

KENSINGTON STEEL CO.

Dept. A, 505 Kensington Ave., Chicago 28, Ill.

● Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of tractor _____

Model _____ No. tracks per belt _____

Width of grouser _____

NAME _____

COMPANY _____

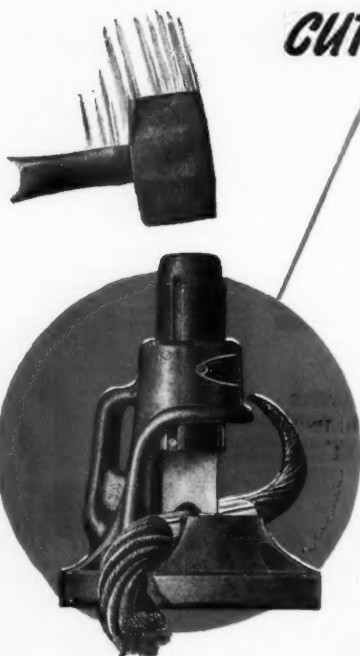
ADDRESS _____

CITY _____ ZONE _____

STATE _____

For more facts, circle No. 272

Morse-Starrett WIRE ROPE CUTTER



SEE YOUR
DEALER
OR WRITE
DEPT. "M"

Morse-Starrett Products Company
1204 - 49TH AVENUE, OAKLAND 1, CALIF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 273



CUTS WIRE ROPE

FASTER...

Especially designed cutting blade and dies assures fast cutting action. . . . The hammer principle eliminates any special skill requirements.

CLEANER...

No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

SAFER...

The enclosed cutting blade locked in the body of the cutter assures perfect safety.

and it's PORTABLE...

Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1 1/2 inch.

Rock drilling equipment

■ The advantages offered by gasoline-engine or electrically-driven Pinazza rock drilling and demolition equipment are outlined in literature from Pitman Industrial Products Co. Pinazza equipment requires no compressor or air hoses.

Three hammer-drill models and six gasoline engine and electric motor drives are pictured along with specifications. The "Centripowered Ram" principle, designed to prevent overloading, and which permits drilling to depths of 16 1/2 feet, is explained.

To obtain this literature write to Pitman Industrial Products Co., 608 Fifth Ave., New York 20, N. Y., or use the Request Card at page 18. Circle No. 117.

FAST, EASY WAY

TO INSTALL PIPE...

AT LOWER COST



PUSH PIPE UNDERGROUND WITH A GREENLEE HYDRAULIC PUSHER

Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement... eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.

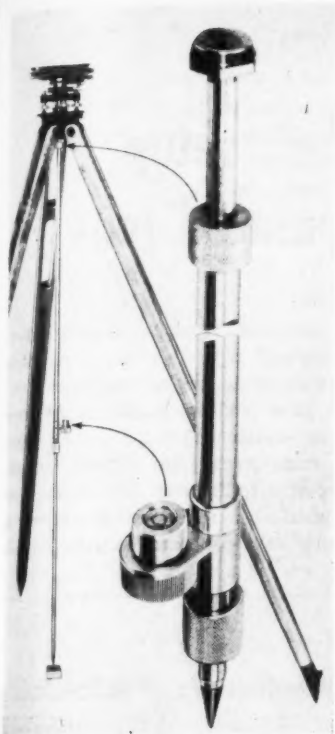


GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2263 Columbia Avenue, Rockford, Illinois, U.S.A.

For more facts, circle No. 274

CONTRACTORS AND ENGINEERS



This telescopic-rod plummet is one of 2 new wind-free plummets announced recently by David White Co.

Wind-free plummets

■ The David White Co., 315 W. Court St., Milwaukee 12, Wis., has announced two new wind-free plummets, one an optical type, the other a telescopic-rod type. Unlike plumb bobs, automatic optical plummets are unaffected by high winds. Self-leveling and light in weight, the devices are made to fit both European and American tripods.

The optical plummet is designed around a double-image sighting system. The observer looks through a window at the side to see two images of the stake tack. These two images move into coincidence when the instrument is directly over the tack.

The telescoping-rod plummet is made of aluminum alloy tubing and fitted with an 8-minute level vial, giving an accuracy of 1/64-inch in its length. This can be reduced to zero by turning the plumb rod through 180 degrees and centering the bubble reading.

This unit's wide range of adjustment makes it usable on almost any kind of tripod.

For further information write to the company, or use the Request Card at page 18. Circle No. 122.

Asbestos metal roofing

■ A bulletin details Steelbestos—a fire-resistant, asbestos-protected metal roofing and siding—manufactured by the American Steel Band Co. The basic components of this material are discussed. Complete information on the types and sizes available, erection methods, insulating capacities, and specifications are included.

To obtain this bulletin write to American Steel Band Co., P. O. Box 565, Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 56.

THE COMPACT, PORTABLE Amsco MF has made its mark in the construction industry over the last two years as a semiautomatic welder designed specifically for manganese steel and hardfacing work on irregularly-shaped parts. The unit has also appeared in many welding shops around the nation, and is now being introduced into other industrial uses. Designed to plug into conventional ac or dc welding units by a single cable, the MF operates on a current range of 150 to 450 amps. For further information write to the American Manganese Steel Division, American Brake Shoe Co., 395 E. 14th St., Chicago Heights, Ill., or use the Request Card at page 18. Circle No. 101.



New
four wheel drive
PAYLOADER
tractor-shovels

“... and it **REALLY** moves material!”

“It’s a good rig with plenty of power. We like its ease of operation — and it *really* moves material!” says E. R. Powers, Asst. Superintendent of Ritchie Bros. Const. Co., Wichita, Kansas, referring to this 1½ cu. yd. HOUGH model HH “PAYLOADER” purchased in July, 1955. This contractor knows what the score is on tractor-shovels, for they’ve been using them for years and have five “PAYLOADER” units.

You, too, can depend on the proven performance of “PAYLOADER” tractor-shovels — built by Hough, the pioneer and leader in unit design, 4-wheel-drive and just about every other noteworthy advancement in wheeled tractor-shovel development. You can depend too on the complete and prompt service provided by the Hough Distributor organization at home and abroad.

This model HH is one of three completely-new 4-wheel-drive “PAYLOADER” models that are finest in Hough history. They all have a sensational new kind of bucket arm design that gives 40 degrees of bucket tip-back at ground level, powerful pry-out action, plus unusual safety, stability and visibility.

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Send data
on new
4-wheel drive
units

- ☐ Model HU—1 cu. yd.
☐ Model HH—1½ cu. yd.
☐ Model HO—2 cu. yd.
☐ Smaller “PAYLOADER” units

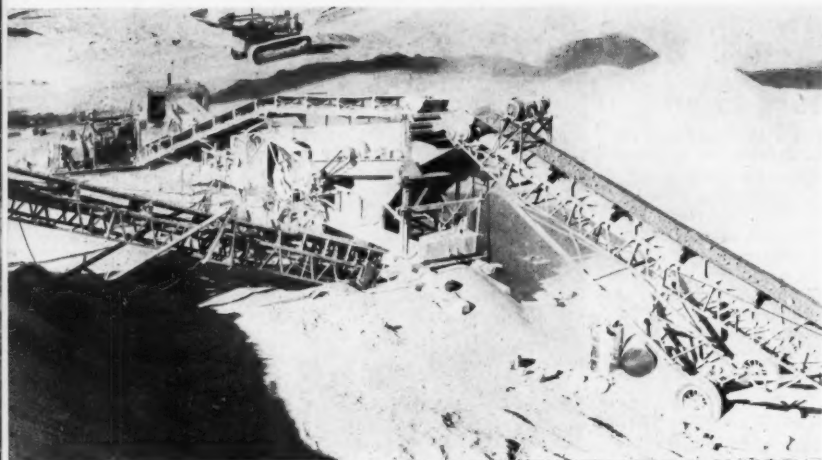
Name _____
Title _____
Street _____
City _____
State _____



PAYLOADER
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 275



The Pioneer 46-VE crusher turns out aggregate filler for the bituminous mix. The portable rock plant, powered by a Caterpillar D17000 diesel engine, earlier turned out the crushed rock needed for subbase work on the road.

One crusher, asphalt setup supply widely separated jobs

Hoops firm started crushing work immediately with its Pioneer 46-VE rock plant.

This portable plant, capable of being moved to a new pit location in less than two hours, had a Caterpillar diesel-electric generating set powering motors on the various conveyors. A Caterpillar D17000 diesel engine,

operating from a nearby stand through a flat-belt drive, furnished the main power for the plant.

Raw feed was pushed to the plant by a Caterpillar D8 and U-dozer, which stacked the pit-run material over a feeder trap. Two dozers were used when the plant hit rates up to 400 tons per hour on rock for the

Two highway jobs and a scarcity of good aggregate might make trouble for many contractors, but one firm faced with this situation simply selected one site where good aggregates were available, then used one crusher and one plant setup for both projects. The biggest remaining problem—hauling the finished product to both road jobs—was handled by renting trucks to supplement the firm's own fleet so that the hot-mix plant could function at peak capacity.

One job, reconstruction of U. S. 93, beginning about 9 miles south of Wells, Nevada, and running 19 miles further south, was made necessary by a faulty subbase, according to Nevada highway engineers. The other, actually a maintenance-by-contract job, was on U. S. 40 just west of Wells. It called for scarifying the old bituminous mat, mixing the old material with subbase gravel underneath, compacting the blend, and repairing with hot-mix to a 40-foot width.

Though Wells is located in sagebrush-covered plains country ringed with mountain ranges, good road-building materials are scarce. Native material has a high plasticity index and becomes unstable if it gets too wet.

Hoops Construction Co., Twin Falls, Idaho, contractor on both jobs for the Nevada Department of Highways, located two acceptable pit sites, both with approximately the same type of rock. Moderately abrasive, containing lime and quartz, and having a specific gravity of 2.70, it shattered well in a crushing plant and made an open but good pavement. Both sites were rocky, and the crushing ratio ran over 50 per cent on the 1½-inch-minus material specified. Plans called for a granular subbase ranging from 9 to 13 inches thick. Coarse rock could be used in the lower 6 inches of this base, but the upper 3-inch mat required 1½-inch-minus rock.

Both pits were located along U. S. 93. One involved a 7-mile dead haul to the southern part of the job on this road. The other, at the north end of the project and more centrally located, was finally selected to serve both projects. Only a minimum amount of grading was required under the \$502,000 contract, so the

JOBS on the move

New design, outstanding features of Allis-Chalmers HD-11 Tractor and HD-11G Tractor Shovel help step up output on all kinds of work



Dozing and excavating in Paradise Valley, Pa., this HD-11 dozer-tractor is working on the job of replacing and relocating parts of a township road washed out in floods. The unit, owned by S. R. Nauman and Sons, Cresco, Pa., is shown here dozing out part of the 2,000-yd excavation, preparing grade for placing 10,000 tons of crushed stone base.



Grading, stripping and stumping are some of the jobs handled by this HD-11 Tractor with hydraulic bulldozer blade. The unit, shown here stripping a gravel borrow pit for fill on roads, is owned by Atlantic County in New Jersey. There's a full program of work for the tractor — snow removal in winter and general maintenance on 390 miles of road the rest of the year.

Contractor works from a centrally located pit; crusher discharges aggregate directly to hot plant

lower 6 inches of the base, which could be as coarse as 2½ inches and still meet specifications. On the 1½-inch material, the plant put out 200 tons per hour, even with the crushing ratio between 35 and 50 per cent.

Rock first was elevated over a conveyor that dropped the material to the bottom screen deck. Pit-run

material already meeting specification size requirements immediately dropped through this deck to a stacker conveyor leading to a disposal pile. Rock retained on the bottom deck screen went to a 10 × 36 jaw crusher acting as a first-stage breaking unit. Throughs were elevated by conveyor to a top screen



Aggregates for the mix are fed directly from the crusher conveyor, right, to the plant dryer of the Pioneer Continuflo plant. At left are the two 10,000-gallon tanks for the asphalt cement and the 8,000-gallon fuel-storage tank for the burner.

deck that separated the acceptable fraction and dropped it through the lower screen and out of the plant. Material retained on the upper deck was sent to a 40 × 22 roll crusher arranged in closed circuit with the top screen deck.

One of the most valuable features of this system, from the plant operator's point of view, was that both jaw and roll crushers could be rapidly adjusted, even while the plant was running, to meet changing pit conditions. If too rocky a material was being fed to the plant, the operator eased off slightly on the jaw-crusher adjustment and routed more material through the rolls. If the roll crusher fraction became too heavy, the jaw adjustment was tightened. Thus, each component was given a full share of the work without being overloaded.

When the plant crushed aggregate for the hot-mix, it used a direct system of dumping, feeding the hot-plant with the end of its discharge conveyor. The method worked well, eliminating a considerable amount of the segregation normal in aggregate stacking of this type.

Conventional methods of subbase installation were used. The rock was trucked to the site, spread according to volumetric measure, and road-mixed to some extent by motor graders. The mix was moistened with water, if necessary, and compacted by steel-wheel and pneumatic rollers. Work was done on stretches that were long enough to permit equipment to operate efficiently, and short enough so that traffic could be handled easily by two flagmen and a pilot car.

Hot-mix output

One of the latest model asphalt plants, a Pioneer 102 Continuflo capable of turning out uniform mixes at rates up to 175 tons per hour, produced the 42,000 tons of hot-mix for the main job and some 10,000 tons for the work on U. S. 40 west of Wells.

The plant consists of two basic components instead of the customary three. Included are a Pioneer 382-R dryer and dust-collection unit and a Pioneer No. 98 central-mix plant, with the necessary auxiliary equipment. This includes a Hy-Way hot-oil heater, two 10,000-gallon skid-

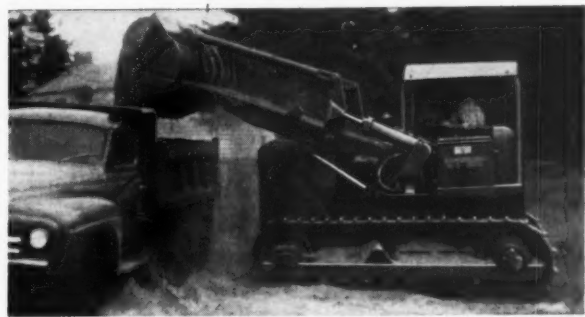


Clearing and skidding on a logging operation is the full-time job of this HD-11 Tractor. Equipped with a canopy and dozing blade, the unit is at work in Deschutes National Forest for Lundgren Lumber Co., Bend, Ore.

Road building and maintenance in Franklin Parish, La., get an assist from a new HD-11 tractor-bulldozer. The unit is at work widening 40 miles of farm-to-market road near Wisner. Later, it will aid with regular maintenance on 1,750 miles of parish road.



Excavating and stockpiling topsoil for a new athletic field in Bel Air, Md., this HD-11 Tractor with bulldozer is on the job about 50 hours a week. The owners, T. & T., Inc., Whiteford, Md., use the tractor to strip topsoil, grade area, replace topsoil and landscape. About 28,000 yd of excavation will complete the job.



Excavating and dirt moving on a 12,000-yd job for a service station location is speeded by this HD-11G tractor shovel. The new unit is one of a fleet of five Allis-Chalmers tractors owned by Bass Construction Co., Seattle, Wash. A new Allis-Chalmers engine, 105 net engine hp, provides plenty of power and handles hydraulic requirements with ease.



Scraping and dirt moving for Don L. Builders, Inc., Kansas City, Mo., this HD-11 Tractor and 7½-yd Allis-Chalmers scraper combination moves 15 yd every sixteen minutes on a 300-yd haul. Operator Ralph Alewel states, "This tractor has plenty of power. I'm running in third gear most of the time. The unit is much more comfortable than any I've been on."

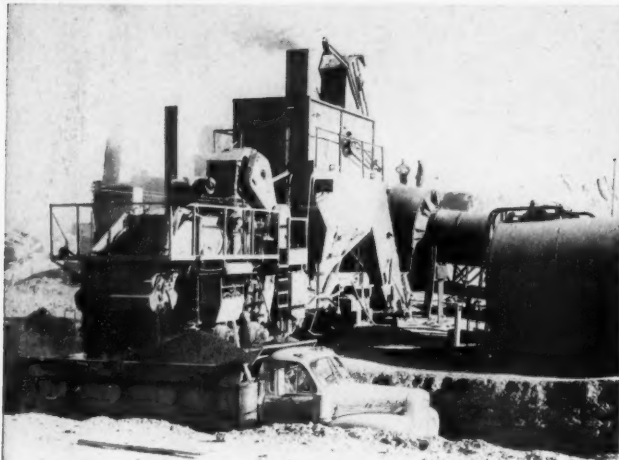
CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Your Allis-Chalmers dealer can tell you where to see HD-11's in action in your neighborhood.

ALLIS-CHALMERS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 276



◀ This Mack truck, one of the units in the company-owned and rented hauling fleet, picks up a load of hot-mix.



Resurfacing of U. S. 40 west of Wells is handled by a Barber-Greene finisher. ▶

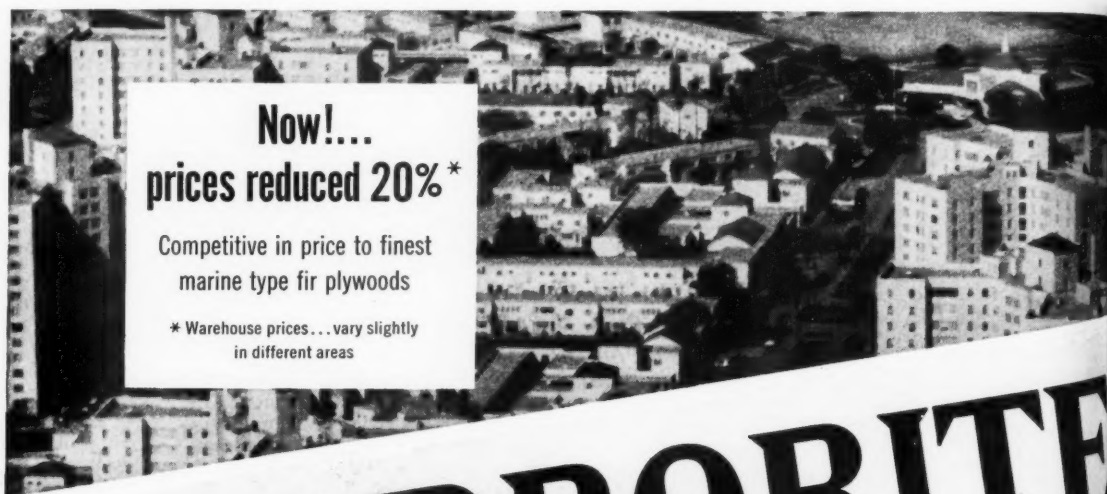
mounted horizontal asphalt tanks for holding the 120 to 150 penetration asphalt cement, an 8,000-gallon fuel-oil storage tank for the Ray burner on the plant dryer, and a Caterpillar D375 diesel-electric generating set to power the plant motors. A centralized electric-control system permits pushbutton operation of the plant.

Although Nevada highway specifications did not require it on this job, the Pioneer 102 is equipped for four-bin separation to meet U. S. Army Corps of Engineers' and other ultimate bituminous designs. The asphalt content of a mix can be changed and hot aggregate sampled while the plant is running, and a batch truck can be pulled up while the truck-loading hopper is being filled. The plant is also equipped with a recording pyrometer, automatic indicator lights that show when a bin runs low, and other modern features.

The mix turned out by the plant contained 60 per cent mineral aggregate from $\frac{3}{4}$ inch to No. 4; 40 per cent aggregate from No. 4 to No. 200; and about 5.4 per cent of 120 to 150-penetration asphalt cement.

Company-owned trucks, forming the nucleus of the hauling fleet, were assisted by rented trucks carrying the hot mix to the paving site. On the job south of Wells, the combination fleet had to make a one-way haul of 19 miles. The main job required a 26-foot hot-mix mat $2\frac{1}{2}$ inches thick, which was laid in two 13-foot strips. West of Wells, on U. S. 40, four 10-foot strips were put down to form a 40-foot pavement. A Buffalo-Springfield three-wheel tandem was used to compact the material. The work on U. S. 93 was completed in less than four months. Then the betterment job on U. S. 40 was started and brought to completion in less than a month after the big job was done.

The difficult job of tearing up and pulverizing the old bituminous mat on U. S. 40 was handled in an almost routine manner by Hoops. A Caterpillar No. 28 ripper working behind a D8 tractor first ripped out the old cake. Then a heavy sheepfoot roller, made to USBR specifications and with foot pressures in the 1,000-psi range, broke up chunks of the bituminous pavement in an initial pass. Two smaller sheepfoot rollers and the scarifier teeth of a motor grader were used on the material. Repeated mixing and sheepfoot rolling soon



* Warehouse prices... vary slightly in different areas

HARBORITE



Harborite... from the
Royal Family of Plywoods

Sales offices and subsidiaries in...

ABERDEEN, Washington
P.O. Box 940 • Phone 221
ATLANTA, Georgia
1161 Ridge Avenue, S.W. • LA 0215

CHICAGO, Illinois
1444 West Cermak Road • CA
CINCINNATI, Ohio
511 Baymiller Street • MA 1-
HOUSTON, Texas
303 St. Emanuel Street • CA

pulverized the old asphalt, which was blade-mixed with the remaining portion of the old subbase and re-rolled to about 95 per cent density.

The second job on this roadway—the installation of an asphalt emulsion seal with chips, was handled by a new Belville self-propelled chip spreader mounted on a rubber-tire Minneapolis-Moline tractor. New to the market this year and made by the Belville Mfg. Co., Shelley, Idaho, this chip spreader can be demounted, freeing the Minneapolis-Moline tractor for other work. The chip coat was bedded in the high-viscosity asphalt emulsion applied by a Littleford distributor. This phase of the job moved so fast that on several days, four miles of work were completed.

THE END

Diesel injector tester eliminates set-up change

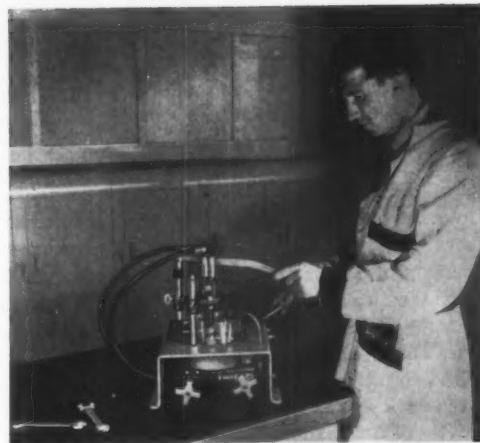
■ An injector-tester fixture checks all GM Detroit Diesel injectors without a major change in set-up. Manufactured by Kent-Moore Organization, Inc., the Rate-Maker tests rack and plunger freeness, spray pattern, and valve opening, holding, and high pressures for all Series 51, 71, and 110 engine injectors.

The unit is adaptable to all of the injectors for these three engines by changing the threaded end connectors. No special conversion units or individual holding fixtures are necessary.

Other features of the J 7000 tester include: a clear-view plastic container; fine-adjustment popping han-

By changing the threaded end connectors, the J7000 makes six tests on all GM Detroit Diesel engine injectors.

dle for checking leaks at pressures higher than the normal valve opening pressure of the injector; a 3,000-pound



gage for faster testing; and a fine-mesh screen to guard against fuel-system contamination.

The complete J 7000 injector tester includes the basic testing unit plus three adapter sets, which are offered separately for purchase in any combination.

For further information write to Kent-Moore Organization, Inc., 5-105 General Motors Bldg., Detroit 2, Mich., or use the Request Card at page 18. Circle No. 75.

Electrode gives steady arc for low-voltage welding

■ An all-position E-6013 electrode, Fleetweld 37, announced by Lincoln Electric Co., is said to have excellent arc stability on both ac and dc units, even when it is used with welders having an open-circuit voltage as low as 44 volts. The electrode can be used with the smaller transformer-type welders, and the sticking tendency sometimes encountered when welding is done with a low current will be reduced.

Shipped in 50-pound packages, the electrode comes in 1/8, 5/32, and 3/16-inch sizes. It is particularly recommended for welding sheet metal when burn-through, sticking, and poor fit-up may be problems, and for steel-plate fabrication. The soft, smooth arc makes clean edge and corner welds, and keeps the danger of burn-through at a minimum when work is done on thin-gage metals.

For further information write to The Lincoln Electric Co., P. O. Box 5758, 22801 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 37.

Gunned concrete

■ A 38-page catalog containing general information, characteristics, and general specifications of gunite is now available. Compiled over a two-year period, the brochure lists the various uses of gunite—for buildings, pile encasements, tunnels, monolithic construction, reservoir and tank linings, repairing deteriorated and spalling concrete, for flood and erosion control, and for a variety of other uses. Action shots accompany the description of each use.

To obtain Catalog G-55 write to Gunite Contractors Association, 714 W. Olympic Blvd., Los Angeles 15, Calif., or use the Request Card at page 18. Circle No. 12.

miracle concrete form panels
may be re-used 125 times!

This overlaid fir plywood...proved lowest cost re-use concrete form material

Harborite is ideal for heavy construction concrete work. Resin-impregnated sheets are permanently bonded to the solid wood core... providing a smooth, long-wearing, abrasion-resistant surface that's 100% waterproof. The overlaid faces will not run, bleed or discolor concrete and have a special affinity for oils and other form finishes. High re-use factor (50 re-uses are common, 125 re-uses are not unusual) assures important savings. Available in over-size panels and standard 4' x 8' size in any thickness.

Ultimate Number of Re-Uses

Mirror Smooth Surfaces

Less Stripping Time

Reduced Finishing Costs

Lower Fabrication Costs

HARBOR
PLYWOOD CORPORATION

Aberdeen,
Washington

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1001 East New York Street • ME 7-3434
JACKSONVILLE, Florida
2355 Dennis Street • EL 4-8229
LOS ANGELES, California
235 South Alameda Street • MI 1854

SAN FRANCISCO, California
3095 Third Street • VA 6-2411
SEATTLE, Washington
North 34th and Fremont • EV 2228
TAMPA, Florida
802 North Rome Avenue • Phone 8-1868

For more facts, use Reader-Reply Card opposite page 18 and circle No. 277

Compact design makes plane easier to operate

■ A low-slung 80-foot plane, said to have the compactness of a 60-foot plane, has hydraulically actuated wheels located directly behind the bowl to carry the weight of the bowl, frame, and dirt. The wheels make the bowl rise and fall inversely with the contour of the ground so that the bowl is on a straight line at all times.

Made by Raymond Gurries Mfg. Co., San Jose, Calif., the GP-80-G has a front truck and a tail wheel that act as gage wheels through an exclusive Gurries linkage to raise or lower the bowl.

Short turns are made easy by the tail-wheel assembly, which supports little more than its own weight. This

The usual heavy superstructure has been eliminated in the compact design of the new Gurries 80-foot plane.

assembly is hinged to swing and has countersprings that hold it on dead center during straight runs. The entire assembly is easily swung over the top of the plane when the rig is to be stored or moved.

The Gurries plane has a self-contained hydraulic system, including a hydraulic pump powered by an air-cooled Wisconsin engine and built-in hydraulic tank. The plane can be handled by tractors of 60 horsepower and up for most maintenance planing, and tractors of 80 hp and up for rough planing, even though the trac-

tors may not have a hydraulic control unit.

For further information write to the company, or use the Request Card at page 18. Circle No. 41.

Thor division appoints new executive assistant

The Cincinnati Rubber Co., Cincinnati, Ohio, division of the Thor Power Tool Co., Aurora, Ill., has appointed William V. Shakespeare assistant to the president. With the firm since 1936, he has been export sales manager since 1951.

For more facts, circle No. 279.

Bulletin on hoses and ducts

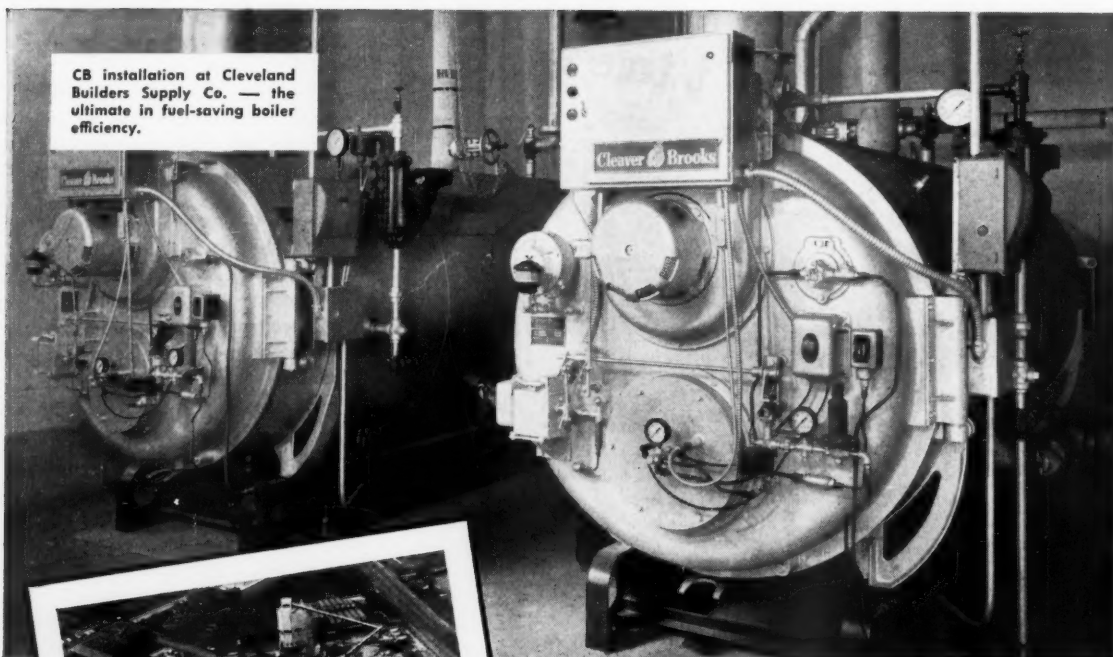
■ Flexaust hoses and Portovent ducts for removing air, dust, fumes, and other materials are the subject of a brochure from The Flexaust Co. Both products have bonded seams, and are made with high-tensile reinforcing wire. Covering fabrics are impregnated and coated with neoprene compounds.

The items are suitable for conveying gas at temperatures of minus-40 degrees F to 275 degrees F. Inside-diameter sizes of the hose and duct range from 1 1/4 to 36 inches, according to the specifications chart.

To obtain this brochure write to The Flexaust Co., 100 Park Ave., New York 17, N. Y., or use the Request Card that is bound in at page 18. Circle No. 86.

Keeping the water hot . . . for America's first electronic ready-mix plant

A job well done by new CB boilers



New Cleaver-Brooks CB boilers meet all heat demands for continuous, high-capacity, winter-time operations

PLANT "J" of the Cleveland Builders Supply Co. is the first to utilize the recently developed Butler electronic batching system. The firm sought to apply the absolute last word in technological progress in selecting equipment — for efficiency, compactness, flexibility and accuracy of control for concrete quality.

Installation of modern, oil-fired CB boilers in this entirely new plant — possibly the largest in the U.S. — was, therefore, a "natural." The twin 80-hp units provide all heat for winter operations, helping maintain the high-level 180-200 cu. yd. per hour schedule set up for the year.

Most modern boilers of their class

New CB brings big boiler standards to users in the 15 to 150-hp class. Unit is years ahead in function, safety and appearance. Money-saving performance is proved on hundreds of installations! For complete details, write for new CB bulletin. Cleaver-Brooks Company, Dept. C, 396 E. Keefe Ave., Milwaukee 12, Wisconsin, U.S.A. Cable Address: CEEBEEWEST — all codes. Ask for catalog AD-137.



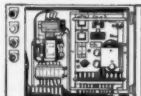
25th YEAR
 TWENTY-FIVE YEARS OF LEADERSHIP
 BY THE ORIGINATORS OF THE SELF-CONTAINED BOILER

For more facts, use Reader-Reply Card opposite page 18 and circle No. 278

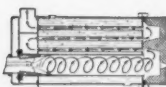
These typical exclusives mean more value per dollar



EASY MAINTENANCE — Hinged doors, front and rear, swing out of way when cleaning tubes.



EASY OPERATION — Controls on front head. Electronic combustion device standard equipment.



FOUR-PASS DESIGN AND FORCED DRAFT — Scrubs more heat from long gas travel. Combustion air in constant supply.



OIL, GAS OR COMBINATION OIL/GAS FIRING — 10-second fuel interchange. Full flexibility for greatest economy.

Added power and capacity in backfiller, trencher

■ A number of improvements have been made in the Model 190 backfiller and the Model 320 trencher made by Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 1, Ohio.

Power has been substantially increased in the backfiller, which has a 93.5-hp diesel engine in place of the 71-hp engine previously used. Easier and more accurate control of the backfill board is also possible with improved clutch lever linkages. There is smoother clutch action, since refinements in the backfill winch clutches provide for a more rapid dissipation of heat. The height of the 190 has been reduced from 9 3/4 to 8 feet for transport, simplifying the job of moving the backfiller over the road on low-bed trailers.

The Caterpillar D339 engine has replaced the D8800 engine in the Model 320 trencher, which has had its trench width capacity increased from 48 to a maximum of 52 inches. Rims and buckets are of 3/4 rather than 5/8-inch high-tensile steel. The conveyor may now be installed for either right or left-hand discharge, and a conveyor extension kit makes it possible to add 2 feet to the spoil discharge point. Also available, in addition to conventional slopers for pipeline trenching, are heavy slopers and dual-discharge conveyors for drainage canal work. The trencher also has a crawler kick-out clutch that makes it possible for digging, conveying, and hoisting to be continued while crawlers are either stopped or started.

For further information write to the company, or use the Request Card at page 18. Circle No. 40.

Gar Wood, St. Paul merge

Two Wayne, Mich., firms, St. Paul Hydraulic Hoist and Gar Wood Industries, have merged to consolidate their lines of truck equipment. Products manufactured under the merger will carry the name Gar Wood-St. Paul, and will include dump-truck bodies and hoists, hydraulically operated material-handling end gates, winches, and truck cranes.

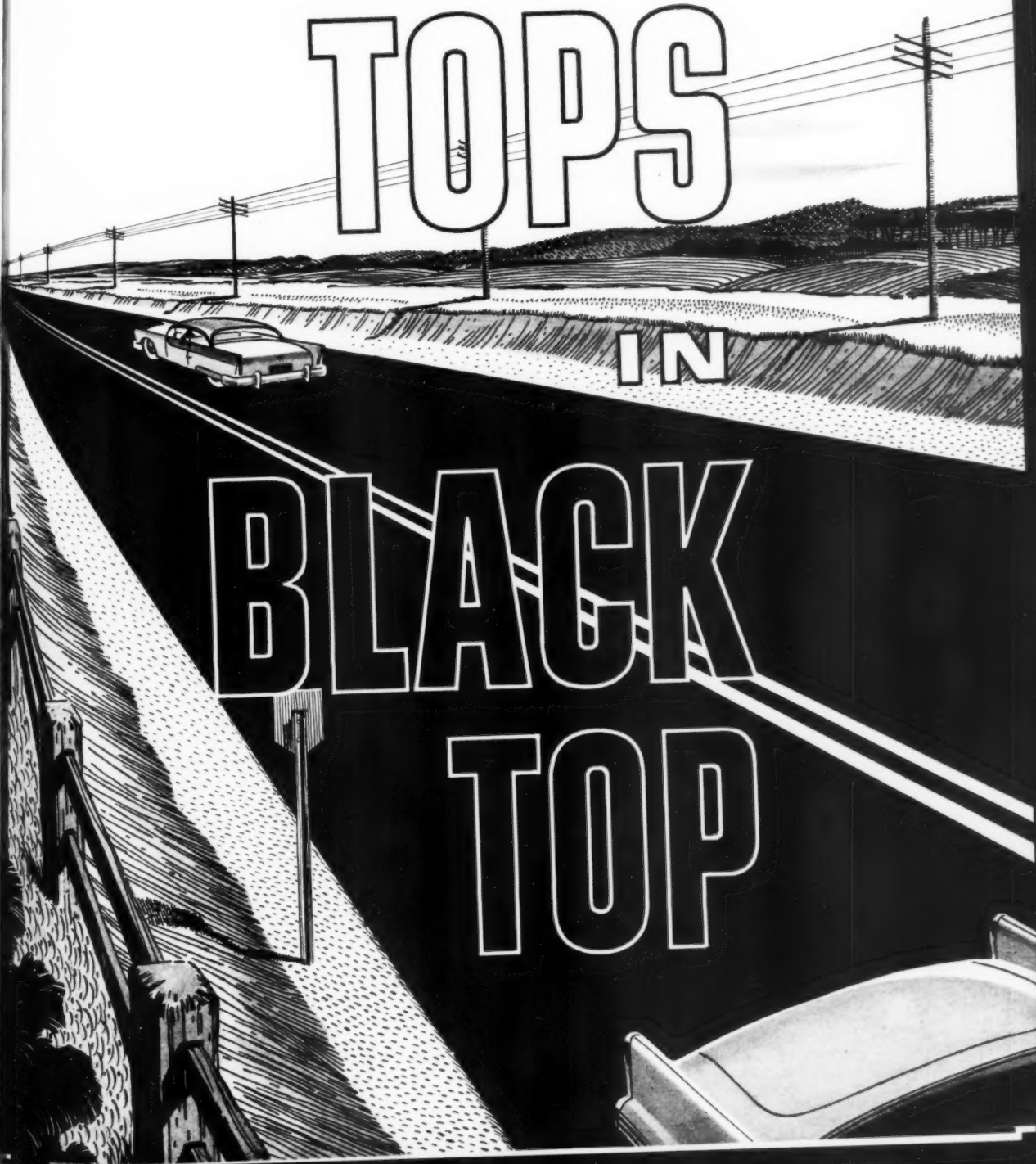
CONTRACTORS AND ENGINEERS



TOPS

IN

BLACK
TOP



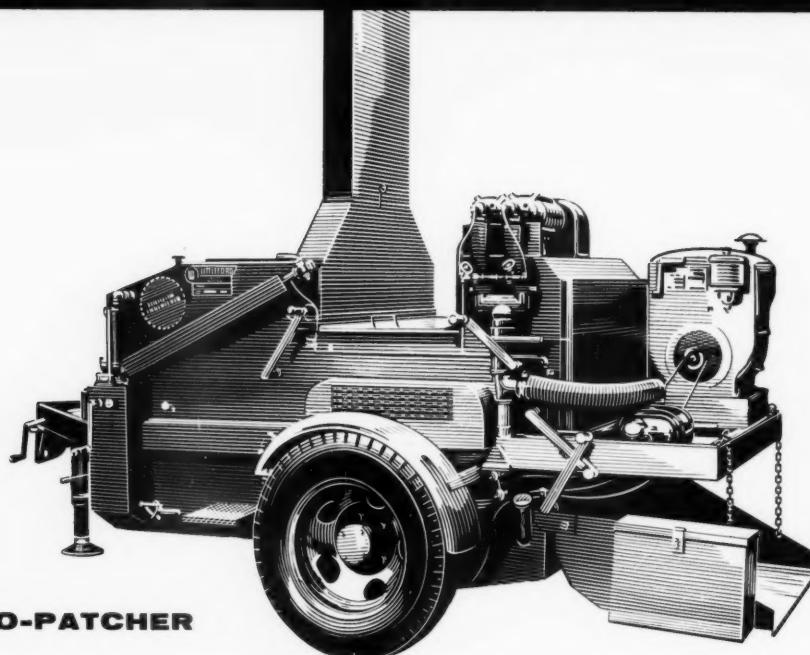


**BITUMINOUS
SUPPLY TANK**

The most efficient means of hauling hot bituminous materials for use in distributors, mixing machines and plants, or to bulk storage. Made in a frameless design. Equipped

with heat flues and burners. Can be provided with pumping units. Single and tandem axle models, 2,000 gallons up to maximum allowable weight. Bulletin 25.

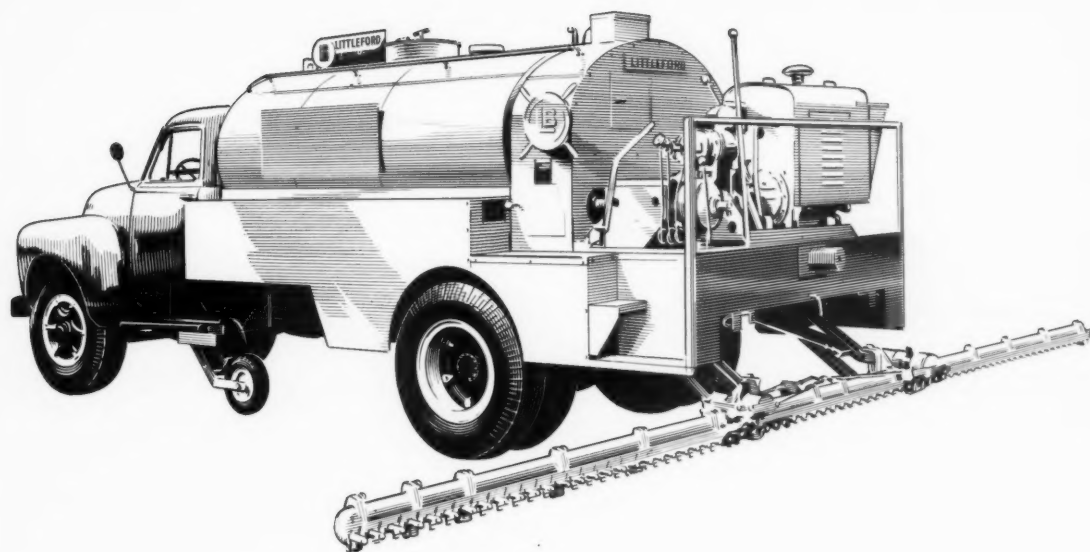
LITTLEFORD



TRAIL-O-PATCHER

Produces hot or cold bituminous concrete right on the job, for patching, paving, or wherever black top is needed. It's self-contained—no other equipment needed. 200-gal. bitumen reservoir

makes it an all-day mixer. And it's an all-weather mixer, too—can be operated in extremes of temperature. Twin pugmills allow thorough mixing and eliminate dust nuisance. Bulletin 28.



Spray Master bituminous distributor

with Full Circulating mechanically operated spray bar

...saves an hour a day

First, you save at least 30 minutes on starting time. The patented damper shuts off the flues, concentrates heat within the heat chamber, thus heating the pump, main valve and piping faster than any other unit. Burners can pre-heat when tank is empty.

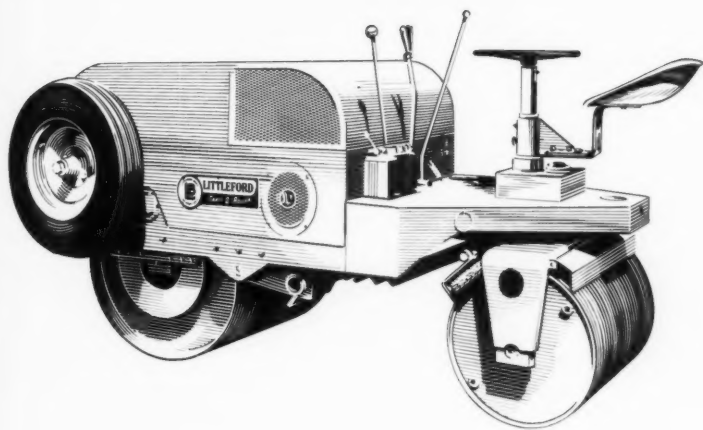
Second, you pick up five minutes on every load thanks to the 2-section full area circulating spray bar which allows the bar to heat to spray temperature faster. Time-saving is but one advantage of the Littleford Spray Master which also offers

- the multi-pass continuous heat flue system at no extra cost (sizes 800 thru 1250-gal. capacity).
- air-cooled flue liner that eliminates burnt out flues forever.
- patented single valve control for spraying, filling, circulating, transferring.
- right angle drive.
- 4-speed transmission with reverse.

For more information showing why the Littleford Spray Master is the best buy in pressure distributors, send today for bulletin FF-14. Littleford Bros., Inc., 300 E. Pearl St., Cincinnati 2, Ohio.



Right-angle drive allows engine to be mounted parallel to the rear head. Eliminates vibration and overhang. Moves engine forward out of spray fog. Clean design and orderly arrangement actually encourages daily maintenance by operator.



PORTABLE ROLLER

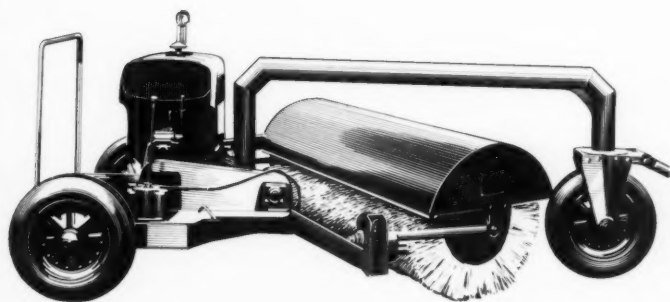
3 models: 2-3 tons (above), 3-5 tons, 4-6 tons, all equipped to give variable compaction. No separate trailer required to transport roller. Easily hitched to towing truck. Bulletins 20, 24 and 32.



UTILITY SPRAY

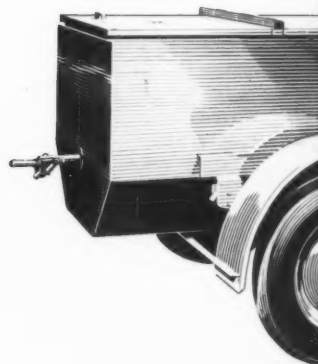
Perfect for municipality work: hand spraying and for crack and pothole filling. Model shown; also available in 3000 and 4000 gallon models.

the world's most complete line of compaction



2-WAY ROAD BROOM

Sweeps right or left. Has exclusive wear-reducing hydraulic lift that raises, lowers and supports the heavy duty brush. Power and traction driven models; sprinkler and blower attachments available. Bulletin 19.



TAR AND ASPHALT SPREADER

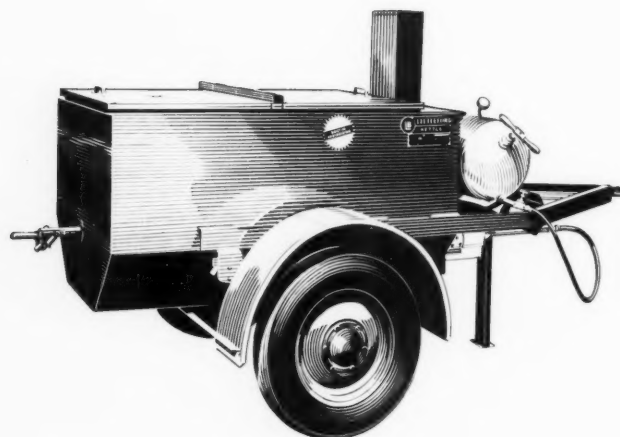
The 84HD, with its patented "hot stuff" delivery system, delivers more "hot stuff" faster, safer. Hand spray and motor spray models available.



UTILITY SPRAY TANK

Perfect for municipality work: for small application jobs, for hand spraying and for crack and joint filling. Truck mounted model shown; also available in trailer type. Bulletin 5.

te line of completely engineered



TAR AND ASPHALT KETTLE

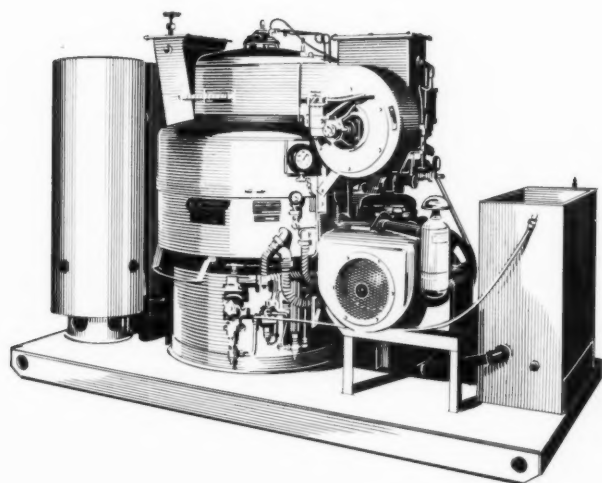
The 84HD, with its patented double heat circulation system, delivers more "hot stuff" faster, at lower cost and with greater safety. Hand spray and motor spray attachments. Bulletin 1.



TANKAR HEATER

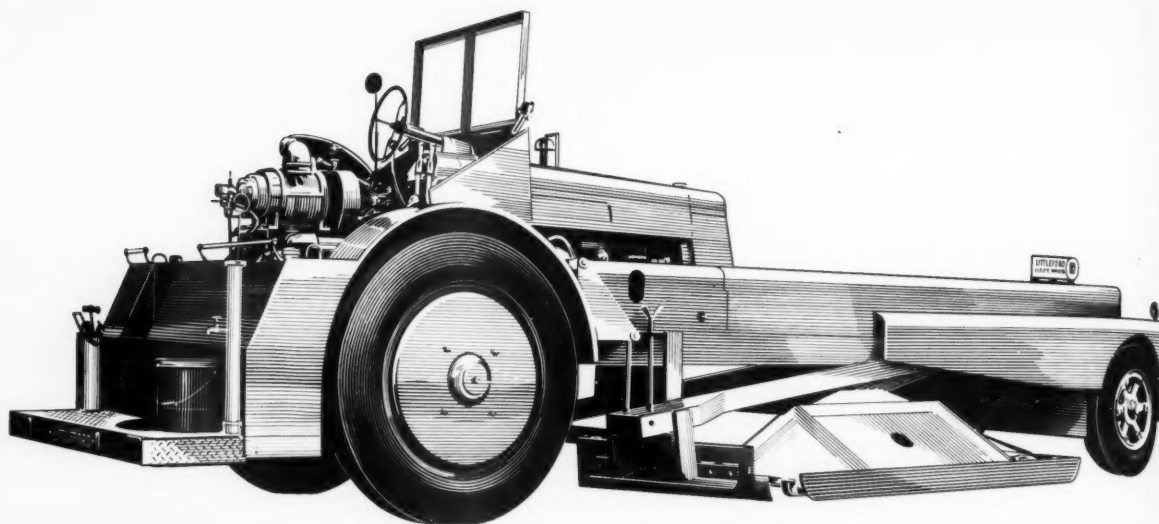
34½ bhp. portable steam generator delivers 200 lbs. of steam 2 minutes after starting burner. Self-sustained, holds enough water, oil and gasoline to operate all day. Completely automatic. Bulletin 21.

Engineered black top equipment



KWIK-STEAM GENERATOR

Delivers steam in 2 minutes from a cold start! Automatic modulating control cuts fuel consumption 50%. Sizes 20 to 165 bhp. Designed for year-round ready mix, pile driving, concrete products curing and for asphalt plants. Bulletin 22.



Littleford-Clarkmoore Heater-Planer and Surface Heater introduces a new technique in street maintenance

The Littleford-Clarkmoore Heater-Planer planes the road surface so smooth you can lay the surface course directly on it . . . thus introducing a whole new technique in street and highway maintenance.

This ingenious giant—at last—permits complete resurfacing of city streets. Adequate maintenance has been impossible heretofore because of the lack of an efficient tool for removing excess bituminous concrete accumulated layer on layer, year after year.

But now the Littleford-Clarkmoore Heater-Planer not only removes the excess material, it also heats and planes a firm, smooth base for the new surface and helps keep it at the proper level.

Conservative estimates indicate the new Heater-Planer will save a minimum of 63¢ a square yard on black top maintenance. For complete information on the money-saving and other advantages of the Littleford-Clarkmoore, write for bulletin 18. Littleford Bros., Inc., 300 E. Pearl St., Cincinnati 2, Ohio.



Planned materials re-used

Blades are positioned so as to windrow the material behind heater-planer where it can be picked up and re-used. Other Littleford-Clarkmoore engineered advantages:

- Hydraulic creeper gear drives the planer smoothly from 8" per minute to 35 fpm.
- Heats and planes 81" wide path in one continuous operation.
- Planes from a skin cut to a depth of 1".
- Single engine and transmission controls and propels planer.



Litho in U. S. A.

MP-80

Convention calendar

March 12-16 National Association of Corrosion Engineers

Meeting, Hotel Statler, New York, N. Y. A. B. Campbell, executive secretary, NACE, 1061 M&M Bldg., Houston 2, Texas.

March 13-15 Michigan Highway Conference

Conference, Pantlind Hotel, Grand Rapids, Mich.

March 16-17 College of Engineering

Centennial Celebration, College of Engineering, University of Missouri, Columbia, Mo. Adrian Pauw, Professor of Civil Engineering, University of Missouri, Columbia.

March 18-21 American Congress on Surveying and Mapping and American Society of Photogrammetry

Consecutive Meetings and 1956 Exhibit, Shoreham Hotel, Washington, D. C. F. G. Williams or W. A. Radlinski, co-chairmen, ACSM-ASP, Box 470, Washington 4, D. C.

March 21-23 New York State Association of Highway Engineers

Annual Convention, Onondaga Hotel, Syracuse, N. Y. Convention Chairman, Highway Engineers Convention Bureau, New York State Department of Public Works, Syracuse, N. Y.

April 2-5 Purdue Road School

Course of Instruction, Memorial Union Building, Purdue University, West Lafayette, Ind. Ben H. Petty, professor of highway engineering, Civil Engineering Bldg., Purdue University.

April 3-4 Earth-Moving Industry Conference

Conference, Pere Marquette Hotel, Peoria, Ill. F. H. Norris, Research Department, Caterpillar Tractor Co., Peoria, Ill.

April 3-5 Ohio Highway Engineering Conference

Tenth Annual Conference, Student Union, Ohio State University, Columbus, Ohio. Emmett H. Karrer, general chairman, Brown Hall, Ohio State University, Columbus.

April 4-6 American Society of Lubrication Engineers

Annual Meeting and 1956 Lubrication Exhibit, William Penn Hotel, Pittsburgh, Pa. William P. Youngclaus, administrative secretary, ASLE, 84 E. Randolph St., Chicago 1, Ill.

April 10-13 Western Association of State Highway Officials

Meeting, Westward Ho Hotel, Phoenix, Ariz. William E. Willey, state highway engineer, 1739 W. Jackson St., Phoenix, Ariz.

April 11-13 South Dakota Highway Short Course

Short Course of Instruction, Union Building, South Dakota State College, Brookings, S. Dak. Emory E. Johnson, professor of civil engineering, Civil Engineering Department, South Dakota State College, Brookings.

April 12-14 American Concrete Agricultural Pipe Association

Sixth Annual Convention, Brown Palace Hotel, Denver, Colo. Howard F. Peckworth, managing director, ACAPA, 228 N. LaSalle St., Chicago, Ill.

April 13-14 Texas Aggregates Association and Texas Ready Mixed Concrete Association

Joint Annual Convention, Statler Hilton Hotel, Dallas, Texas. Ray L. Cain, executive secretary, TAA, 201 Perry-Brooks Bldg., Austin, Texas.

April 16-20 Greater New York Safety Council

Twenty-sixth Annual Safety Convention and Exposition, Statler Hotel, New York, N. Y. Paul F. Stricker, executive vice president, GNYSC, 60 E. 42nd St., New York 17, N. Y.

April 23-25 American Wood Preservers Association

Meeting, Jung Hotel, New Orleans, La. W. A. Penrose, secretary-treasurer, AWPA, 839 17th St. N. W., Washington 6, D. C.

MARCH, 1956

May 8-10 Highway Transportation Congress

Sixth Congress, Hotel Mayflower, Washington, D. C. Arthur C. Butler, director, National Highway Users Conference, National Press Bldg., Washington 4, D. C.

May 11-12 Michigan Engineering Society

Seventy-sixth Annual Convention, Pantlind Hotel, Grand Rapids, Mich. D. B. Apted, secretary, MES, 945 San Lucia Drive, Grand Rapids, Mich.

May 17-19 New York State Society of Professional Engineers

Convention and 30th Annual Engineering Industries Exposition, Hotel Statler, New York, N. Y. Howard Beecher, P. E., chairman, publicity committee, NYSSPE, 1941 Grand Central Terminal, New York 17, N. Y.

May 20-22 Building Research Institute

Annual Meeting, Sheraton-Brock Hotel, Niagara Falls, Ontario, Canada. William H. Scheick, executive director, BRI, Na-

tional Academy of Sciences, 2101 Constitution Ave. N. W., Washington 25, D. C.

May 21-24 Pan American Convention of the International Road Federation

Convention, San Salvador, El Salvador, C. A. Robert O. Swain, executive director, IRF, 1023 Washington Bldg., Washington 5, D. C.

May 23-25 National Society of Professional Engineers

Meeting, Ambassador Hotel, Atlantic City, N. J. Paul H. Robbins, executive director, NSPE, 1121 15th St. N. W., Washington 5, D. C.

May 28-30 Wire Reinforcement Institute, Inc.

Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington, D. C.

May 28-June 2 Concrete Reinforcing Steel Institute

Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. H. C.

Delzell, managing director, CRSI, 38 S. Dearborn St., Chicago 3, Ill.

June 4-7 Material Handling Institute and Material Handling Show

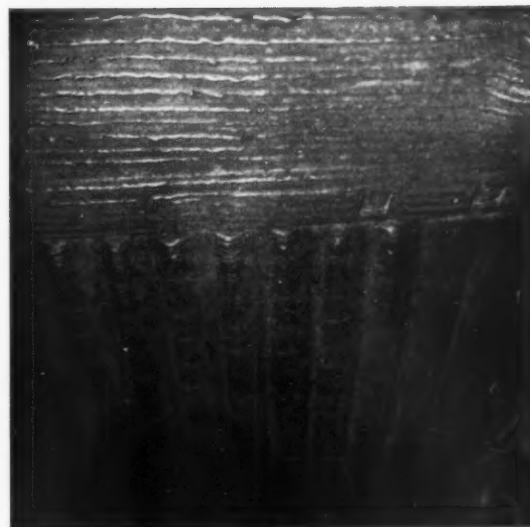
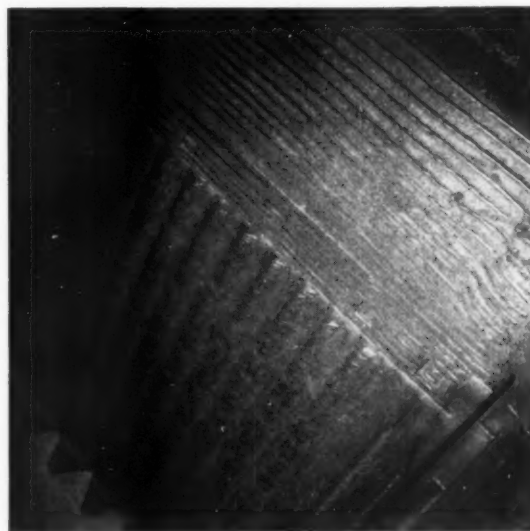
Meeting, Public Auditorium, Cleveland, Ohio. R. K. Hanson, managing director, MHI, Inc., 813 Clark Bldg., Pittsburgh 22, Pa.

June 4-8 American Society of Civil Engineers

Meeting, University of Tennessee Campus, Knoxville, Tenn. Don H. Mattern, general chairman, ASCE, 513 Union Bldg., Knoxville.

Lippmann chief engineer

Byron C. Redeen has been appointed chief engineer of the Lippmann Engineering Works, Milwaukee, Wis., manufacturer of crushing, screening, and conveying equipment. Mr. Redeen has been the firm's chief sales engineer for the past five years.



how to EXTEND working life of jaw crushers apply VICTOR HARDFACING

No Disassembly This jaw crusher was hardfaced with jaws bolted in place, using 3/16" coated Tube Victorite. Despite cramped working area only 12" deep and 36" wide, high deposition rate and low spatter loss enabled welder to get uniform, non-sagging, long-wearing bead without distorting jaw.

Downtime Saver Because it goes on fast, without flux interference, and sets up quickly, coated Tube Victorite is wonderful for hardfacing on the job without disassembly of equipment.

Where To Use Coated Tube Victorite is a high alloy content rod with Rockwell C hardness of 55-58. It was developed specifically for tools subject to severe abrasion and impact, such as:

Ripper Teeth	Tool Joints
Pug Mill Augers	Scraper Blades
Jaw Crushers	Asphalt Mixer
Roll Crushers	Paddle Shanks
Die Rings	Mill Hammers
	Bucket Lips

Free Help—Victor hardfacing manual shows you the right rod to use and how to apply it. Ask your Victor dealer for manual and descriptive leaflets on Tube Victorite and other Victor rods . . . or write us.

Profitable
dealerships open;
inquire now!

VICTOR

for hardfacing

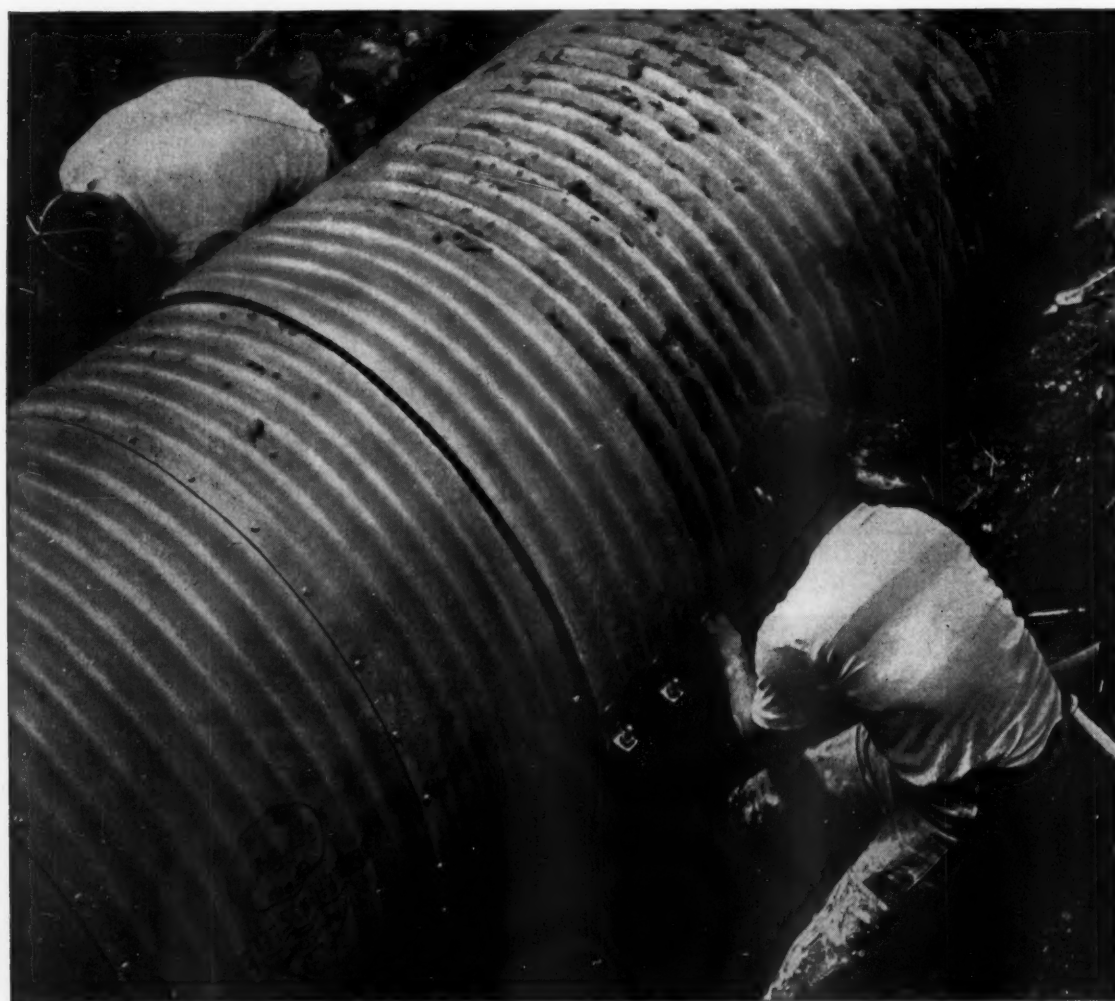
VICTOR EQUIPMENT COMPANY
ALLOY ROD & METAL DIVISION

Los Angeles 59, California • Wakita, Oklahoma

For more facts, use Reader-Reply Card opposite page 18 and circle No. 280



One of the D7 tow-Cats is used to help a welding truck up a steep slope. Three of these Caterpillar tractors, equipped with winches and $\frac{3}{4}$ to 1-inch-diameter cable, also held backhoes on the slopes.



Pipe made of Beth-Cu-Loy is easy to install

This is a 48-in. drainage line fabricated of corrugated Beth-Cu-Loy galvanized steel. Workmen are joining a 14-ft length to the rest of the line. You can see how simple and quick this operation is: a band of Beth-Cu-Loy secured around the joint with a few turns of a wrench on the bolts.

No sealing compound needed here, no mortar, no waiting for the joint to set. The laying of the pipe can move as fast as the trenching, and the trenching itself is a less "finicky" job with Beth-Cu-Loy because of steel's strength and flexibility. Light weight of the pipe simplifies laying.

Pipe made of Beth-Cu-Loy conforms to grade and align-

ment without pulling apart. Further, it will flex with the fill to equalize loads around it. It absorbs vibration, impact and the shifting effect of weather changes.

Bethlehem manufactures the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. If you would like further information about Beth-Cu-Loy, or the names of those who make pipe with it, just get in touch with the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



For more facts, use Reader-Reply Card opposite page 18 and circle No. 281

Rigs hack through rough and

One of the fastest pipelining jobs recently completed was that on the 16-inch gas-gathering line, running from about 12 miles southwest of Big Piney, Wyo., to a tie-in near Opal, 54 miles away. Part of the main gathering system that will bring natural gas from the Big Piney fields for Pacific Northwest Gas Co., the pipeline will be tied into the main-line system now being constructed into the Oregon-Washington section of the Northwest. Eventually, it will form a section of the gas-distribution system beginning to take shape in the Northwest and Canada.

Despite the rough Wyoming terrain, Curtis Construction Co., Inc., Casper, Wyo., put the line down in about a month, reaching an average production rate of about 10,000 feet daily. The firm is now preparing to start on 82 miles of 22-inch line that will carry the gas from Green River to Sage, Wyo.

Five Caterpillar D8 tractors with dozers—heading the equipment spread that strung out 25 miles along the 54-mile right-of-way when work really got rolling—started the clearing operations, removing sagebrush and some small trees, and doing a considerable amount of grading. Clearing work on the 50-foot-wide right-of-way was kept about four miles ahead of the next operation all during the job.

At the Big Piney end of the job, where rocky cliffs blocked the path of the Cats, drilling and blasting was necessary. Gardner-Denver 600 and 500-cfm compressors, along with several Cleveland wagon drills using Timken rock bits handled this assignment. The equipment was later used to excavate ditches through the rocky terrain. The wagon drills used on this phase of the work were sometimes hauled around with an assist by the tractors. Olin 40 per cent gelatin-type powder was used in column-loading the holes, and broken rock was shoved aside by the dozers.

Heavy ditching

The average depth of the trench is 56 inches—deep enough so that there is an adequate cover over the pipeline. Though winter temperatures in this section of the country are some of the lowest in the nation, and frost penetration goes deep into the ground, the depth of the line protects it from freezing and thawing action. About 50 per cent of the 54 miles of trench is in such rocky material that digging had to be done with backhoes.

Digging was easier for the other half of the trench, which was ex-

CONTRACTORS AND ENGINEERS

lay 54-mile gas pipeline

Ditchers and backhoes split trenching operations; equipment has to be helped up steep grades

cavated with conventional machines. For this part of the work, Curtis used two Cleveland Model 320 ditching machines with H & L detachable teeth on their endless chain of buckets. Both machines accounted for approximately two miles of trenching per 12-hour shift when digging conditions were favorable. Pipe sections were strung on one side of the ditch; dirt on the other. And since the ditch lines left by the machines were neat, the job of assembling and laying the pipe was simplified.

In rocky terrain, where heavily bedded limestone and shale had to be loosened with high explosives, the Gardner-Denver 500 and 600-cfm compressors and the Cleveland wagon drills worked ahead of backhoe equipment, drilling staggered holes along the ditch lines. Drills and compressors worked far enough apart from each other so that men had plenty of room to work as holes were carried down to grade level or slightly below for good explosive effect. Holes were loaded with Olin high explosives at a ratio of about $\frac{2}{3}$ pound of powder per cubic yard of rock.

Broken stone was removed by five Northwest Model 25 backhoes and left along one side of the ditch. At times the machines had to work on grades so steep that their diesel engines tended to lose oil pressure. Three D7 tow-Cats with Hyster rear-end winches and $\frac{3}{4}$ to 1-inch-diameter steel cable were used by general superintendent G. L. Mims to hold backhoes on these steep slopes and to help other equipment move around. On the steeper hills, the Caterpillar tractors anchored themselves near the top of the slope and used their cables to handle equipment working on the slopes.

Backhoe equipment also accounted for an average of 10,000 feet of trench daily. If a week or 10 days' run of excavation went through rock, the capacity of reserve equipment was enough to keep the trenching operations ahead of pipe-laying crews. This reserve capacity enabled trench excavation to be carried far ahead of other operations within about two weeks after the job started.

Pipe handled rapidly

The 16-inch 40-foot joints of steel pipe, fabricated by Lone Star Steel Co. at Dangerfield, Texas, arrived at the job on flat cars. A single unloading point at Opal, Wyo., served the entire project. A Unit truck crane lifted the joints from cars, and an International truck equipped with an A-frame and Tulsa winch was used

as a cherry picker around the yard. These two pieces of equipment permitted pipe to be unloaded from cars, and loaded to transports at the same time.

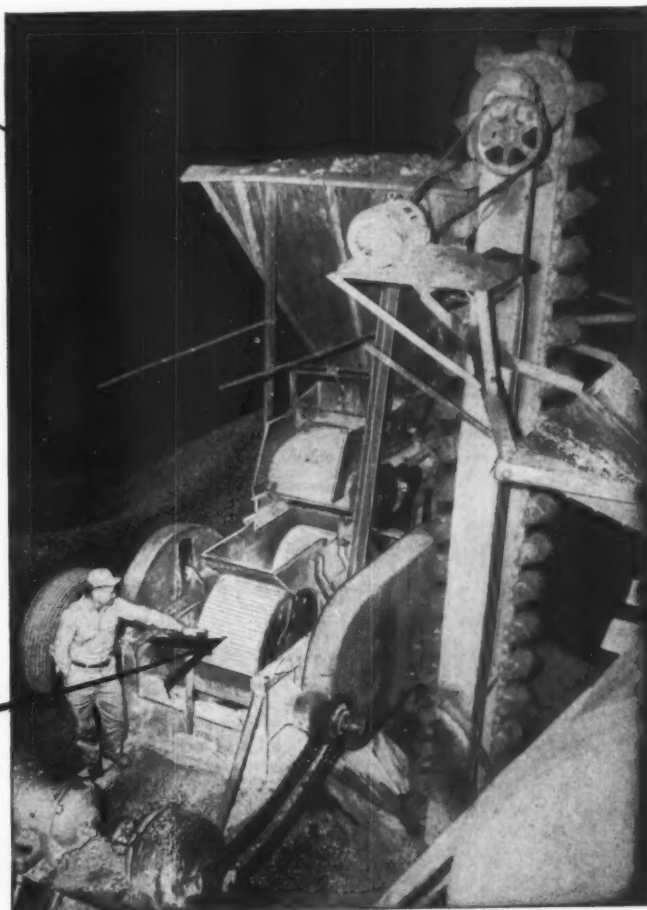
(Continued on next page)



The initial stringer pass is made on the line just behind the joining gang. This welding is done with two Lincoln 300-amp welders driven by a Caterpillar D315 diesel engine from a single driveshaft.

Crushing Life
Increased 500%
by
Hard-Facing

with
HAYNES 90 rod



Hard-facing the rolls in this crusher rig with HAYNES 90 Rod makes them more than 5 times more durable. Two sets of rolls are used to crush rock from 3-in. down to $\frac{1}{2}$ -in. screen size. They handle up to 26 thousand tons of rock with a minimum of repairs—despite severe wear from abrasion and impact. Other hard-facing materials wore out before 5,000 tons of rock were crushed.

Since HAYNES 90 Rod was adopted as the standard material on this job, production increased, down-time was reduced, labor and maintenance costs were cut, and less hard-facing material was needed per ton of rock crushed. This is typical of the kind of savings that can be realized by hard-

facing with HAYNES alloys.

HAYNES hard-facing alloys give outstanding service when used to protect parts in crushers, shovels, tractors, trucks, conveyors, and other metal parts exposed to wear from abrasion, impact, corrosion, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including: HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt-base rods, and HAYSTELLITE tungsten carbide tube rods. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See...

or

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Your local Haynes Stellite Dealer

to Haynes Stellite Company

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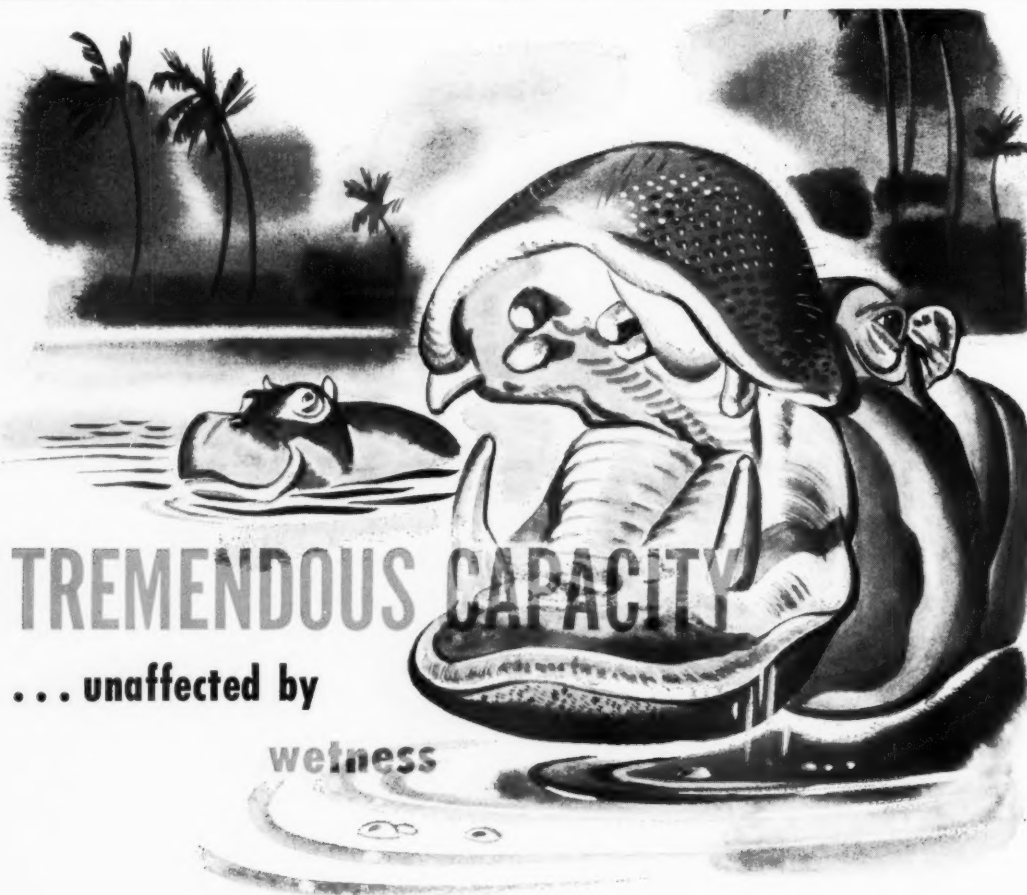
For more facts, use Reader-Reply Card opposite page 18 and circle No. 282



Before the 16-inch pipe sections are welded to the line, their beveled joints are cleaned with a Thor buffer powered by a Wisconsin generator.



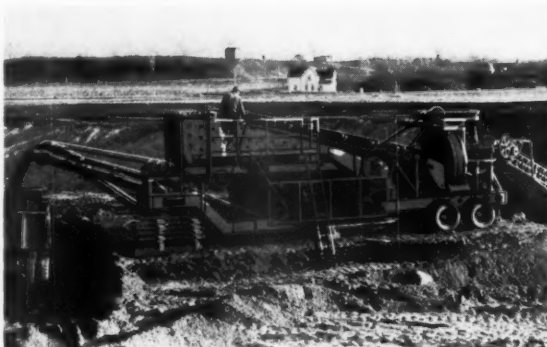
A Caterpillar D7 tractor uses a Trackson side boom and Superior pipe tongs to handle a 40-foot joint as cribbing supports the pipeline beside the trench.



Big and adaptable, the hippo is a master in water. He can float like a log . . . submerge for 30 minutes . . . run across the bottom of a lake at eight miles an hour. On land, he runs as fast as a man . . . gallops at considerable speed . . . forages more than 25 miles a day to satisfy his huge appetite. Universal built the 880 SENIOR "R" GRAVELMASTER like Nature built the hippo — for sustained performance under any conditions.

Wet, sticky material won't stop production when you're operating an 880 Senior "R". A 10" x 36" jaw teamed with a 30" x 26" roll crusher and a 4' x 12' inclined gyrating screen assures tremendous capacity. It takes an inclined gyrating screen to handle water-soaked pit-run material smoothly and efficiently.

Big and adaptable, the 880 Senior "R" can range like a hippo over wide territory. Travel it cross-country and see! The hippo-like quality of tremendous capacity unaffected by wetness adds to your profit when you own an 880 Senior "R". Compare the 880 Senior "R" with competitive plants and you'll find a lot of other hippo-like features. Everything bigger — but the price!



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UNIVERSAL ENGINEERING CORPORATION

620 C Avenue N.W., Cedar Rapids, Iowa

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 283

(Continued from preceding page)

Curtis did its own pipe stringing with a fleet of Ford and GMC hauling trucks, augmented in rough terrain by Caterpillar tractors with side booms.

The numerous bends necessary to shape the pipeline to the changing terrain were made by a vertical-type C-R-C bending machine. Even on rough ground, it moved down the line, handling each of the sections very carefully so that none would be ruined. In the few places where tie-in plugs had to be left, where special pieces had to be installed across flat lands where water was a problem, or where a section of pipe had to be augered under a highway or other utility, relatively short sections of pipe were completed by the bender and other equipment, then lowered into place after work had been completed on both sides of these locations.

The gang assembling the sections kept its equipment working at a pace as fast as the other crews. At the head of this crew was a Caterpillar D7 tractor with a Trackson pipe layer side boom, and a set of Superior pipe tongs. As men steadied the pipe, this machine picked up each section, quickly trundled it a short distance back to the pipe already laid, and held it there while welders joined the new section to the line. Timber cribbing supported the line so that no destructive stresses would be set up in the first weld.

Working closely behind this operation were two men who handled a small Wisconsin-driven electric generator which supplied power to a Thor grinding and buffing machine that cleaned the beveled joints before sections were joined and welded.

Welding on the Curtis job was sublet to Pipelining & Construction Co., Oswego, Kans. This firm is headed by R. S. Perkins, a veteran pipeline man who directed welding on 200 miles of the Inter-Provincial pipeline around the head of the Great Lakes, on 100 miles of the Platte pipeline, 120 miles of the Service pipeline, and 130 miles of the difficult Oil Basin line in Montana. Not a single test weld, made by certified welders, failed on Curtis' line.

Perkins put the stringer bead in

CONTRACTORS AND ENGINEERS

with two Lincoln 300-amp machines driven by a Caterpillar D315 diesel engine from a single driveshaft. Fleetweld No. 5 improved rod was used for this stringer pass. The same type of welding rig then made a hot pass, using Fleetweld's No. 85 rod. Six Lincoln 200's followed to put in filler and cap beads, also with No. 85 rod. Approximately one-third of the welded joints were X-rayed by Pipeline X-Ray Service Co., Houston, Texas, and the pictures showed that good, solid welded joints had been established.

Cleaning, priming, and coating followed, an M. J. Crose pipe-cleaning machine first cleaning the exterior walls thoroughly and applying a coat of bitumastic primer. A dope machine was used to apply the finish bitumastic coat and gave the pipe two wrappings of protective paper, one of them a spun-glass product. This coating was carefully checked by spark-detector equipment for any uncoated places. If any were found along the line, they were repaired immediately.

Mims used several Caterpillar D8's and D7's equipped with Trackson pipe layer booms to lower the line into the trench. Wherever necessary in rocky sections, sand and gravel padding was laid above and below the pipe for protection. Backfill was shoved into the trench by either a dozer or a general backfiller and left uncompacted, and bulldozers handled the final cleanup operations, smoothing out the right-of-way as much as possible.

THE END

Swivel for crane hooks

A swivel-end fitting that can be quickly connected to or disconnected from crane hooks is being produced by General Machine & Welding Works, Inc., 1100 E. Second St., Pomona, Calif. Fittings may be custom designed or machined to meet requirements.

The Miller Quick Connect swivel is brought to the fixed position when a ball swedge is inserted in the side opening and a line drawn through the slot to the seating position. Secured by a ball held in place by an Allen Head set screw and neoprene plug, the piece is ready for any tension-type work. The fitting is released simply by reversing the assembly procedure.

For further information write to the company, or use the Request Card at page 18. Circle No. 80.

Pipe fittings and supplies

Meckum pipe fittings and supplies for hydraulic material handling are illustrated in a bulletin from the manufacturer. Elbows from 22½ degrees to 90 degrees, flanges, and dresser couplings for steel pipe are shown. Victaulic pipe couplings, hoses, and hose clamps are also covered. Specification tables accompany each item.

To obtain Bulletin No. 600 write to Meckum Engineering, Inc., Dayton Road, Ottawa, Ill., or use the Request Card at page 18. Circle No. 62.

Fluorescent luminaire

A new fluorescent luminaire for lighting white-ways, tunnels, and underpasses has been announced by Pfaff & Kendall, 84 Foundry St., Newark 5, N. J.

Designated the Luxaire, the unit is easily mounted on existing poles or on companion-designed P & K davits or standards.

According to the manufacturer, records on existing installations show the Luxaire produces 40 per cent more light than filament-type lamps using the same energy. The light is said to be free from glare, and excellent in retaining color values.

For further information write to the company, or use the Request Card at page 18. Circle No. 125.



"I picked it up when that highway construction crew went through here last month."

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GREEN-CON ABRASIVE BLADES give you savings as high as 80%—with completely new series of "Green-Con" Reinforced Abrasive Blades that cut "Green concrete" with the widest possible range of HARD to SOFT Limestone Aggregates.

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 284



THE PORTER-CABLE Model 108 saw, combines minimum weight and maximum power and safety features, including the KickProof clutch and an auxiliary front-blade guard. Blade size is 8 1/4 inches, which permits a maximum depth of cut at 90 degrees of 2 1/8 inches and at 45 degrees, 2 1/2 inches. Precision ball bearings are at stress points. Accessory equipment

includes a rip guide, carrying case, cross-cut guide, protractor gage, and a saw blade adapter. The Contractor's Special is available in kit form. For further information write to Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y., or use the Request Card at page 18. Circle No. 138.

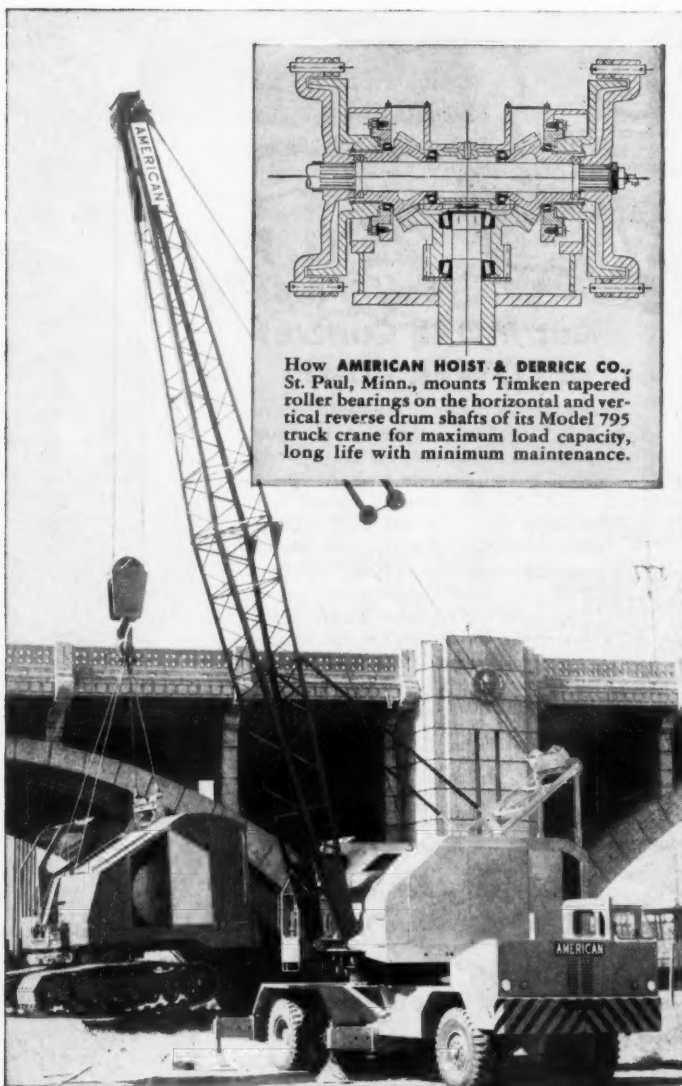
High-speed equipment relocates Ohio road

Modern, high-capacity equipment has kept the Bruns Coal Co., Zanesville, Ohio, coal-mining and contracting firm, ahead of schedule in relocating and improving U. S. Route 50 from the Ohio River westward through Washington and Athens counties in southeastern Ohio.

Three Euclid scrapers and a Mississippi Road Service scraper, each with a capacity of about 20 cubic yards, a new Euclid TC-12 Twin Crawler 388-hp two-engine pusher, and a new Huber-Warco 5D-190 195-hp motor grader, are all working on a particularly hilly 4-mile section running from a point just east of Athens to Canaanville. This part of the job involves total relocation of the highway and the construction of a new roadway.

U. S. 50, a vital link between the north and the growing industrial area in the south, provides access to the Pike County Atomic Project and also serves the lake region of Ohio. A 180-foot hill in the 4-mile section is the focal point of the job, because it has to be leveled before the new stretch of road can be built. Since work started in September, this hill has been cut to about one-third of its original height. The hill also serves

TIMKEN® bearings vital in operating truck crane at maximum capacity, lower cost



How AMERICAN HOIST & DERRICK CO., St. Paul, Minn., mounts Timken tapered roller bearings on the horizontal and vertical reverse drum shafts of its Model 795 truck crane for maximum load capacity, long life with minimum maintenance.

THIS versatile American truck crane handles four tough jobs as crane, shovel, backhoe and dragline. The picture shows an unusual use for this 45-ton crane. Loads on the shafts and gears in the drum assembly are very heavy. And these crane units must operate steadily at maximum capacity with simple, easy maintenance. That's why American Hoist & Derrick Co. uses Timken® tapered roller bearings in vital positions—drum shaft, horizontal slewing shaft reverse gears, vertical slewing shaft, retract shaft gear hub, retract shaft intermediate gear, and independent travel vertical drive shaft.

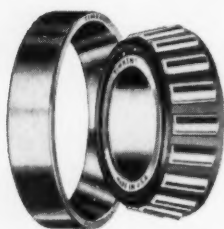
Because of their tapered construction, Timken bearings take both radial and thrust loads in any combination. And full line contact between rollers and races provides extra load-carrying capacity. Shafts are held in rigid alignment. Gear mesh is smooth and accurate—wear is reduced to a minimum.

To take the shock loads often encountered, rollers and races of Timken bearings are case-carburized to get hard, wear-resistant surfaces over tough, shock-resistant cores. And true rolling motion makes Timken bearings practically friction-free. As a result Timken bearings provide long bearing life with minimum maintenance wherever wheels and shafts turn.

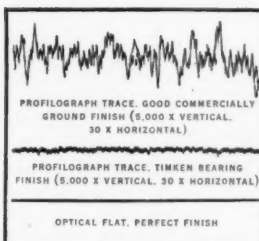
To assure finest bearing quality, we make our own fine alloy bearing steel—America's only bearing manufacturer that does. To be sure you get the most for your money, specify Timken bearings when you design, build or buy machines. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



SMOOTH TO MILLIONTHS OF AN INCH

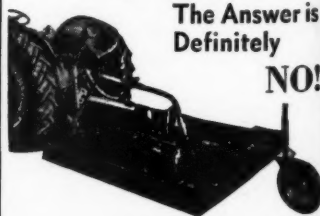
Surface finish of high quality Timken bearing rollers and races is so smooth that it takes a profilograph to measure its smoothness. This instrument measures surface variations to a millionth of an inch, as shown at the left.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION. For more facts, use Reader-Reply Card opposite page 18 and circle No. 285

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5. Special ROAD TRAVEL HITCH—Saves Tractor Hydraulic.
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CONTRACTORS AND ENGINEERS

Scrapers, pushers, and 195-hp grader modernize U. S. 50; four-lane highway to carry traffic from north to south



Between passes by the scrapers, the Huber-Warco grader crowns, slopes, and grades the haul road. The contractor estimates that this permits more than 15 trips a day with the scrapers.

as a fill area for the new roadway in the lowlands to the east.

The scrapers, traveling at top speed, move into position on the hill, and the Euclid pusher gives them the extra power they need to pick up a full load and get off to a fast start. Then they descend the hill, cross the old road on their way to the new roadway, and dump their loads on the fly about 1½ miles away. Throughout the daily 10-hour shift, the TC-12 pushes a constant succession of loaded scrapers.

Keeping the haul road in top shape is vital to the success of the operation since it will become the elevated base for the new highway. The Huber-Warco 5D-190 does this job by moving back and forth along the 1½-mile stretch, keeping it clear for the scrapers as they come downhill. This permits the scrapers to make more than 15 trips a day. The Huber-Warco unit also keeps the roadway crowned for efficient drainage, and with its power sliding moldboard, it slopes the edges.

Two Caterpillar D8 bulldozers, a D6 dozer, a water truck, and a roving service truck equipped with welding apparatus are also being used on the job, which is scheduled for completion in July.

THE END

INDIAN

DRINKING WATER & SUPPLY TANK NO. 75G



Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is served to fit the back. Sturdy construction. Highly popular.

SMITH GARDEN KING
Low-priced power
Sprayer

12 gallon capacity
For spraying all types
water repellents for
masonry and cement
work and many other
spraying purposes.
Briggs and Stratton
Motor. Very high quality.



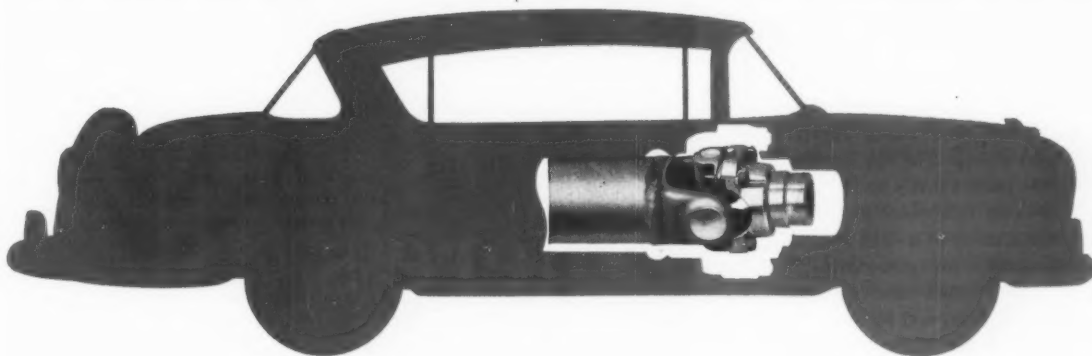
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Catalog

D. B. SMITH & COMPANY
"Choice for Quality the World Over"
470 Main St., Utica 2, New York

For more facts, circle No. 287

MARCH, 1956

FIRST



FIRST to make an Automobile Joint smaller—(3-9/16" swing diameter) to reduce the clearance needed by the low floor boards in modern cars.

FIRST to make the smaller joints stronger—(2500 lbs. ft. torque) to meet the needs of higher speed, higher power modern cars.

FIRST to make the smaller, stronger joints lighter—(20% less than other joints having the same torque capacity) to help designers keep overall weight down to modern standards.

FIRST to make the smaller, stronger, lighter joints easier to install—(less parts to handle) to save time and money on the assembly line.

Send a print and specifications of your new model for MECHANICS engineers' recommendations how you can give your next car the benefit of these four competitive advantages—provided by the new MECHANICS joint development.

MECHANICS UNIVERSAL JOINT DIVISION
Borg-Warner • 2030 Harrison Ave., Rockford, Ill.
Export Sales: Borg-Warner International
79 E. Adams, Chicago 3, Illinois

MECHANICS

Roller Bearing

UNIVERSAL JOINTS

For Cars • Trucks • Tractors • Farm Implements • Road Machinery •
Aircraft • Tanks • Busses and Industrial Equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 288



ONE OF THE FIRST of the 1956 Gar Wood models to go into operation in the South is this new Buckeye 305 ditcher used by the R. S. Smith Construction Co. to excavate a trench at Midfield, Ala. The trencher not only cuts accurately and quickly for water and sewer lines, but it has also proved economical in excavating for residential footings, according to the manufacturer. For further information write to Gar Wood Industries, Inc., Wayne, Mich., or use the Request Card at page 18. Circle No. 104.

Easy-to-read slide rule has green-yellow background

■ Black figures on a green-yellow background make the new Pickett & Eckel Eye-Saver slide rule easier to read, and permit it to be used faster and more accurately. The manufacturer reports that this particular background color makes figures and calibrations more sharp than those on slide rules with a white background.

A white background, it is explained, reflects all colors of the spectrum, including violet and red rays that focus in front of and behind the eye's retina. Green and yellow rays, the only kind reflected by the Eye-Saver slide rule, focus exactly on the retina.

Aside from this visual feature, the new rule is made of a light alloy that is non-corrosive and non-rusting. The metal construction also eliminates warping, swelling, and binding.

The Eye-Saver slide rule is available in 6 and 10-inch trig, log-log standard models, or in special types made to order.

For further information write to Pickett & Eckel, Inc., 1109 S. Fremont Ave., Alhambra, Calif., or use the Request Card at page 18. Circle No. 130.

One-man chain saw

■ A mailing piece features the Rite-Way Timberhog Bantam chain saw in 18 to 22-inch capacities. Features illustrated include a compact two-cycle engine, an automatic clutch which stops the chain when the engine is idling, double-row struts which prevent twisting in making cuts, and an easily sharpened chain.

To obtain this mailing piece write to Rite-Way Dairy Div., Package Machinery Co., Putnam Bldg., Springfield 7, Mass., or use the Request Card at page 18. Circle No. 28.

Worthington Corp. elects two new vice presidents

Elston J. Tribble and Aloysius M. Tullo have been elected vice presidents of the Worthington Corp., Harrison, N. J. Mr. Tribble, former assistant vice president in charge of manufacturing, will supervise several of the firm's operating divisions. Mr. Tullo will continue as general manager of the Harrison works.

Aluminum pipe

■ The characteristics and advantages of aluminum pipe and fittings are described in a catalog from Aluminum Company of America. Applications of aluminum pipe, including its use in pipelines, and portable and structural piping are discussed. Installation details—cutting, bending, beveling, grooving, threading, welding, use of supports, thermal installation, and weathering protection—are given. A series of tables and graphs on dimensional and performance data complete the catalog.

To obtain this catalog write to Aluminum Co. of America, 770 Alcoa Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 60.

900 cu. ft.

This is the king of them all... the 900 cu. ft. CP Rotary! Here a CP 900 supplies the 110 lbs. plus required to operate a Vulcan 50C differential pile hammer driving 180 foot piles.



there's
a

CP rotary compressor

365 cu. ft.

There's nothing like this 365 cu. ft. CP Rotary compressor for excavation and highway construction. Here it supplies air for the simultaneous operation of a pair of G-150 Wagon Drills and their powerful 3-inch Drifters.

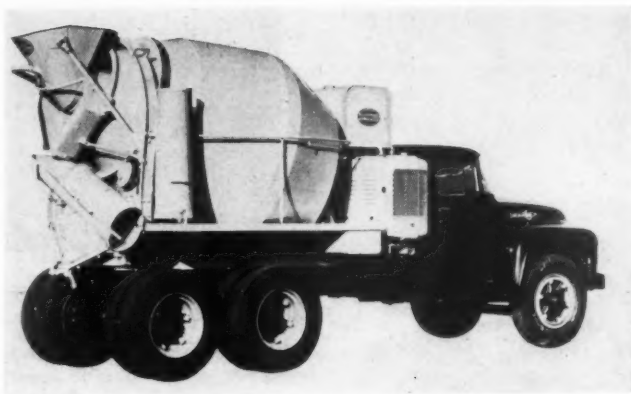


■ An improved line of Westinghouse transit mixers marketed in five sizes from 4½ to 6½ cubic yards features a fully-enclosed gear-drum drive, two-speed transmission, double-action mixing drum, and a new swing-away chute to permit direct discharge.

The fully-enclosed gear drum drive is expected to cut maintenance expense drastically because there are no exposed gears or chains to wear out and break. The two-speed transmission permits a wide range of rotating speeds with efficient engine operation. The double-action mixing drum has six auxiliary reverse mixing blades and is said to assure a faster, better, and more uniform mix in less than the minimum turns specified on the rating plate.

The new swing-away discharge

Operating efficiency, maintenance features highlight new transit-mixer models



chute eliminates the need for removing and replacing the chute head when the truck mixer is discharging into high forms, hoppers, and buckets. The operator merely pulls two pins, swings the chute out of the way, swing it back, and relocks it in normal position.

A self-aligning drum mounting eliminates the possibility of trouble arising from truck and mixer frame flexing on rough terrain. Misalignment is prevented by a ball-and-socket front-end mounting at the drum.

For further information write to the Westinghouse Transit Mixer Division, LeTourneau-Westinghouse Co., 217 S. Belmont Ave., Indianapolis, Ind., or use the Request Card at page 18. Circle No. 131.

600 cu. ft.

This battery of 600 cu. ft. "Power Vane" Rotaries supply all the air required to maintain schedules for pile driving and jetting.



Chicago Pneumatic "Power Vane" Rotaries make the beatings of continuous heavy duty service under all conditions with an absolute minimum of attention. For really big jobs, there's nothing that approaches the performance of the "Power Vane" 900 — the only 900 cu. ft. compressor that has proven itself in pipe line testing, pile driving, and caisson lifting. "Power Vane" Rotaries are also available in 600, 365, 210 and 125 cu. ft. models. For more details, see your CP equipment distributor.

Chicago Pneumatic Tool Company,
3 East 44th Street, New York 17, N. Y.



Chicago Pneumatic

Pneumatic Tools • Air Compressors • Electric Tools • Diesel Engines
Rock Drills • Hydraulic Tools • Vacuum Pumps • Aviation Accessories

Compressor for every job!

125 & 210 cu. ft.

This two-wheel unit is a favorite of utility construction men. It's ideal where it is important to get on the job quickly and get it done.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 289

Cold-applied joint sealer resists exhaust damage

■ A new compound developed by the Manu-Mine Research & Development Co., P. O. Box 167, Reading, Pa., has many applications in the construction, repair, and maintenance of highways and streets. Although expected to find use primarily for sealing the joints of highways and airport runways, the compound is also recommended for repairing joint ruptures, cracks, and crevices that result from the constant pounding of highways by heavy rolling stock.

Manu-Tite is a cold-applied substance, designed to withstand the heat of exhausts of big trucks on highways and of jet aircraft on airport runways. It will not be dissolved by gasoline, oil, or jet fuels. The compound is applied with an industrial caulking gun.

For further information write to the company, or use the Request Card at page 18. Circle No. 133.

Data on torque converters

■ The ways of increasing the efficiency of excavator shovels by using torque converters are told in story form in the latest issue of "Production Road" magazine, house publication of the Twin Disc Clutch Co., Racine, Wis.

Complete with charts and on-the-job photographs, the magazine also gives tips on efficient power transmission in other types of construction machinery.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 108.

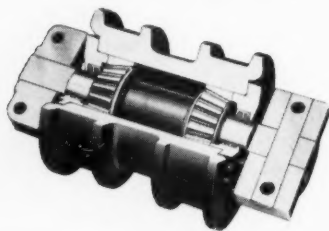
Screw thread inserts

■ Data on threaded inserts for replacing worn screw threads or for use as original equipment is contained in a bulletin from Hell-Coil Corp. The thread inserts are available in national or unified coarse or fine. Thread size, insert number, length, diameter of drilled hole, finishing taps, and tools are given. Specification charts are also included on automotive and aircraft spark plugs and tapered pipe.

To obtain Bulletin 708 write to Hell-Coil Corp., 1496 Shelter Rock Lane, Danbury, Conn., or use the Request Card at page 18. Circle No. 83.

Tractor roller

■ A new bearing-type tractor roller has been announced by X-L-O Roller Corp. The roller, grease packed at the factory, comes ready to be installed



and is said to need no maintenance for a year or 1,500 operating hours.

An induction-hardened shell of high Brinnell hardness provides long-wearing surfaces without distortion

in the shell and flanges. The shaft, drilled and plugged for greasing, has a pressure relief fitting. Metal to metal seals keep dirt and moisture from entering the bearing section, and retain grease. Shims are used for easier repair and any needed bearing take-up.

For further information write to X-L-O Roller Corp., P. O. Box 338, Torrance, Calif., or use the Request Card at page 18. Circle No. 110.

Starting fluid improved

■ The mist-type starting fluid, Spray, which is marketed in a pressurized can, has now been improved with a new propellant. According to the manufacturer, the propellant makes the fluid spray out effectively in tem-



peratures as low as 65 degrees F below zero. It also withstands heat up to 180 degrees, making the starting fluid easier and safer to store.

Spray starting fluid is designed to insure fast engine starting in cold and damp weather.

For further information write to Spray Starting Fluid Co., P. O. Box 584, Camden 1, N. J., or use the Request Card at page 18. Circle No. 130.

Gledhill buys plow line from Davenport Bessler

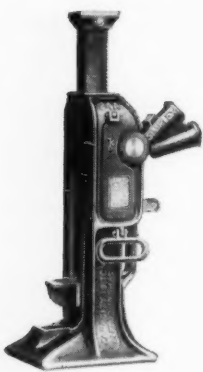
The snowplow business of the Davenport Bessler Corp., Davenport, Iowa, has been purchased by the Gledhill Road Machinery Co., Gallon, Ohio. The Gledhill firm will combine the new line with its present line.

Already - established Davenport Bessler distributors will continue to handle the snowplows, as will the Gledhill dealers.

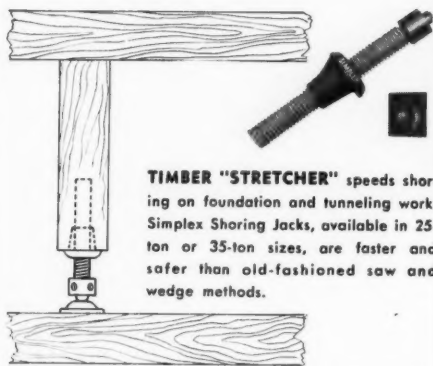
Doing It the Easy Way with SIMPLEX JACKS...



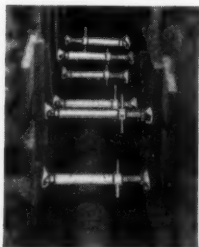
PRESTRESSING CONCRETE SLAB with a Simplex Re-Mo-Trol 30-ton hydraulic puller. When cured, 26' x 38' slab will be raised to form third story floor of school building. Intervening floors will then be cast, prestressed and raised into position. Only Re-Mo-Trol gives straight-line pull to prestressing wires through unique "center-hole", eliminates need for complicated back-up devices. Also has many uses as a powerful lifting jack on construction jobs.



15-TONS OF LIFT on either the cap or toe of this Simplex Model 24A jack is a feature that construction men like. Full capacity toe lets them lift from minimum clearances, cuts wedging and blocking necessary. Jack is ratchet lowering lever type; raises or lowers notch-by-notch—can't be tripped. 13" of lift.



TIMBER "STRETCHER" speeds shoring on foundation and tunneling work. Simplex Shoring Jacks, available in 25-ton or 35-ton sizes, are faster and safer than old-fashioned saw and wedge methods.



WHEN YOU'RE DOWN A HOLE you can feel safe with these Simplex Trench Braces on the job. Made entirely of drop forged steel. Easy to adjust, grip at any angle, can be nailed to timber for slip-proof safety. For any width trench.

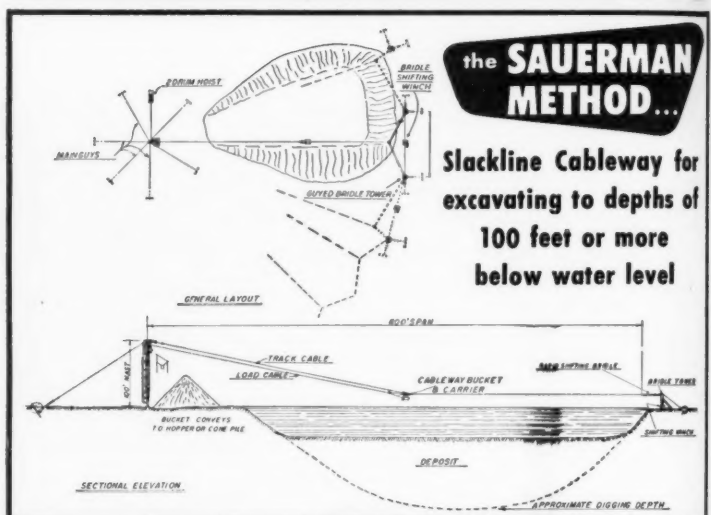
SIMPLEX CONSTRUCTION JACKS are fully described in General Catalog 53. Write for a free copy.

TEMPLETON, KENLY & CO.

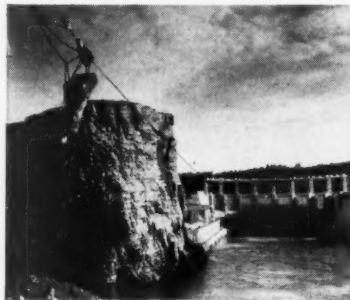
2511 Gardner Road • Broadview, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 290

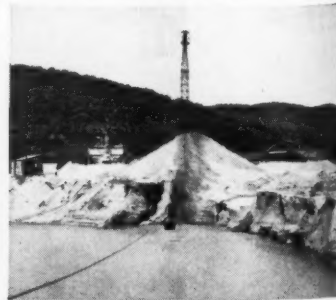
HOW TO DO A BETTER UNDERWATER EXCAVATING JOB



Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridge is not needed for many deposits.



Cableway at Cabinet Gorge Dam digs and hauls from tailrace 1000 ft. away. (Full details in Sauerman News No. 143.)



New York gravel producer switched to cableway for underwater operation of his pit. Average haul is 600 ft. from a 50-ft. depth (Sauerman News No. 141).

You can remove more underwater material with a long reaching Sauerman Slackline Cableway. On job after job this machine has proved to be the most efficient for this type of operation. It is especially effective where the material to be excavated has good depth and will flow to the bottom of the cut. For shallow deposits or non-caving material a rapid shifting device is used to change the line of operation.

One man controlling the hoist digs, conveys and elevates from deposit to plant over spans of 1000 ft. or more . . . across streams, lakes, bogs or deep pits. The powerful load line pull insures digging penetration. Tensioning the track cable lifts the bucket which is inhailed at high speed and dumps automatically. Gravity return completes the fast operating cycle. Bucket capacities range from 1/3 to 3 1/2 cu. yds.

To get fast, economical long range excavation, and the shortest, most direct way from pit to pile use a slackline cableway. Contact Sauerman for specific recommendations. No obligation. Request Catalog C, showing detailed specifications and photos of slackline cableways in action on all types of deep digging jobs.

SAUERMAN BROS. INC.

616 S. 28th AVE. | BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Duroline Blocks

For more facts, use Reader-Reply Card opposite page 18 and circle No. 291

CONTRACTORS AND ENGINEERS

Water cans and coolers for field use

Any beverage can be served from the hot-dipped galvanized Water Boy cans and coolers because of the new Sparkleen liner used in the containers. The liner, a chemical substance sprayed on the interior of the cans



Beverages are kept safe in galvanized Water Boy coolers by the new Sparkleen liner.

and coolers and baked at a high temperature under infra-ray lights, is guaranteed by the manufacturer to be completely nontoxic. The liner keeps beverages free from foreign odors or tastes, and even lemonade, an acid beverage, can be served from the containers.

Water Boy coolers are constructed with riveted ears and handles, a recessed faucet of nickel-plated brass, double-locked seams and bottoms, corrugated sides, a nonmovable inset support, and extra-large dead-air insulation space. Both water cans and coolers come in four sizes—2, 3, 5, and 10 gallons. The coolers are equipped with a spigot.

The heavy-duty Water Boy containers, available in 3, 5, and 10-gallon sizes, are insulated with Fiberglas and have a heavy welded band at the bottom for extra protection.

For further information write to Schlueter Mfg. Co., 4616 N. Broadway, St. Louis 7, Mo., or use the Request Card at page 18. Circle No. 79.

Stud drivers

■ The Remington stud driver for concrete and steel is featured in a mailing piece. The driver has aluminum alloy housing, a thick steel box-type guard, and is for two-handed operation. Standard-head, breakoff-head, and internal and external-thread studs are shown in half their actual size. These studs are recommended for maintenance and other uses.

To obtain this mailing piece write to the Industrial Sales Division, Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 24.

THIS PORTABLE CEMENT PLANT built for George M. Brewster & Sons, Inc., Bogota, N. J., has a height of 42 feet—8 feet less than usual—because of the low headroom required by the two 4-cubic-yard Burmeister mixers. Supplying concrete for a variety of work, the plant has a 300-ton three-compartment aggregate bin that is constructed with a minimum of pins rather than the conventional bolts, to facilitate transport. The installation, furnished as a complete package by L. Burmeister Co., 4535 W. Mitchell St., Milwaukee, Wis., includes all starters, solenoid-operated gates, slump meters, moisture compensator, counters, timers, recorders, and other accessory equipment. For further information write to the manufacturer, or use the Request Card at page 18. Circle No. 42.



Industrial Type—
P&H Diesel for
Crane "Upper"

Automotive Type—
P&H Diesel for
Crane Carrier

For the Complete Powering of Truck Cranes...

IT PAYS TO STANDARDIZE ON P&H DIESELS

In the past Diesels have never been welcomed for the complete powering of truck cranes. Slow starting—stalling while idling—insufficient acceleration have proved handicaps to their acceptance, especially for powering of the carrier.

Now these limitations to the use of Diesels for complete powering have been totally overcome through new P&H product developments. Highly responsive P&H Engines—Series C-18 accelerate and decelerate as fast—idle as well without fouling or clogging—start in normal temperatures as quickly as a gas engine.

When you standardize on 2-Cycle P&H Diesels for complete powering, you get the right Diesel power for the right job. An Automotive Type-P&H Engine in the crane carrier takes you wherever a truck can go—gets you between jobs fast. An Industrial Type-P&H Engine in the crane "upper" helps you handle any crane assignment with plenty of slow, sure, steady power for maximum control, safety and production.

For the first time you can burn fewer gallons of low-cost Diesel fuel in both truck crane engines. Use of 2 similar type P&H Engines also results in easier understanding and better maintenance of both engines by one man. Savings are substantial, too, on parts inventorying and repair costs. All wearing parts are interchangeable between P&H Engines.

If you want money making and money saving power, it will pay you to investigate the complete powering of your truck cranes with P&H Diesels.

P&H Product Development Features In New Series C-18 P&H Diesels

For Quick Starts—automatic retarding of the fuel injection until P&H Engine speeds reach 500 r.p.m.

For Good Idling—use of P&H developed injector tips with a single, large hole to prevent fouling or clogging.

For Instant Response—new, simplified P&H fuel system providing fast acceleration and deceleration.

For Dependable Power—new P&H Power Assembly, new cooling system, new dual porting of cylinders for better combustion—more power.

For Less Down-Time—simplicity of P&H Diesel design, interchangeability of all wearing parts and the P&H "Unitized" Power Assembly.

P&H Diesel Engines are available in 2, 3, 4, and 6 Cylinder Models for the complete powering of truck cranes from 15 to 35 tons in size.

For Modern Engineering Look to HARNISCHFEGER

P&H DIESEL ENGINE DIVISION
Crystal Lake, Illinois

Please send me additional information on P&H Diesel Engines for complete powering of truck cranes.

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

P&H Diesel
Engine Division—
Harnischfeger Corp.
Crystal Lake,
Illinois

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 292

Contract sewer cleaning cuts cost of special jobs

Power-driven rod with pipe-size cutting tool drives through obstructions; auxiliary lines not necessary

by GLENN STROMBERG
Repair and Construction Engineer
Chicago Park District



After the clogged drain has been cleared with a pipe-size cutting tool mounted on the end of 1,000 feet of continuous steel rod, a power-operated bucket on a winch line removed loose debris.

FARRELL-CHEEK WEDGE TYPE WIRE ROPE SOCKETS

AND OTHER
WIRE ROPE
ACCESSORIES



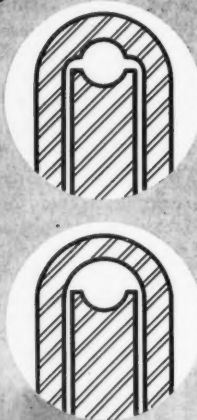
LARGE
TO SMALL

CAST FROM "F85"
SPECIAL ALLOY

IMPROVED

OR

STANDARD



FARRELL-CHEEK STEEL CO.

HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS	RAILROAD CASTINGS Locomotive and Car R. R. Specialty Castings	GEARS AND PINIONS "True Tooth" Gears and Pinions, Shafts and Wheels.	STOKER PARTS Feed Screws, Furnace Tools, Flanged Pipe, etc.
F-C HARD EDGE STEEL CASTINGS	ELEVATOR, CONVEYOR PARTS Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers, Bushings.	CRANE WHEELS Overhead, Gantry, Mono- rail, Ingot Car, Charging Machine.	HEAVY HARDWARE Complete Line Wire Rope Fittings and Cutters, Bar Benders and Cutters.

YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION
PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

SANDUSKY, OHIO

Hiring a contractor to take care of special sewer-maintenance problems has not only proved more efficient, but also has saved time and money for the Park District of the city of Chicago, Ill.

Three years ago, a 600-foot section of 12-inch drain running from a swimming pool to a city main had become so clogged with roots and debris that it was almost impossible to empty the pool. That special equipment was needed became obvious after several unsuccessful attempts by city maintenance men to clear the line.

The National Power Rodding Corp., Chicago, was called in to do this job, and since then has also cleared several other blocked lines with a pipe-size cutting tool mounted on the end of 1,000 feet of continuous steel rod. Paid out as the tool is power-driven through the blockage, the rod moves forward and backward, turning and cutting as it goes. Virtually no obstruction, short of collapsed tile, can stop the work.

Clearing the obstructed swimming-

pool line reduced the time required to drain the pool from 24 to 8 hours.

Not long ago, we discovered that a section of 4-inch drain line under a heavy structural slab was solidly plugged with mortar. Conceivably, this line could have been opened with equipment that the district already had on hand, but this would have meant cutting into a 15-inch reinforced-concrete floor. National Power Rodding was able to clear the line in a few days without disturbing the floor at about a quarter of the amount the district had estimated for other methods.

A mile-long section of 12 to 24-inch main drain on the lakefront just east of Outer Drive became clogged with large quantities of sand which had sifted through catch basins into the main. Other debris also had drifted in through the drive's hydraulically operated traffic dividers connected to the main by 8-inch lateral storm drains.

When the park district started cleaning operations of this section last summer, it became immediately

You can be
Sure...

when PROTECTIVE
MAINTENANCE is due

HOBBS ENGINE HOUR METERS make it easy to plan a definite program of protective maintenance on your powered equipment. ON-TIME maintenance means longer equipment life . . . less down-time . . . fewer repairs — a more profitable operation in the long run.

ACCURATE—Not a Revolution Counter

The HOBBS HOUR METER records ACTUAL RUNNING TIME on all types of powered equipment — stationary or mobile — gasoline or Diesel. This electric timing instrument tells you the HOURS and MINUTES of engine operation — important accuracy no revolution counter can provide.

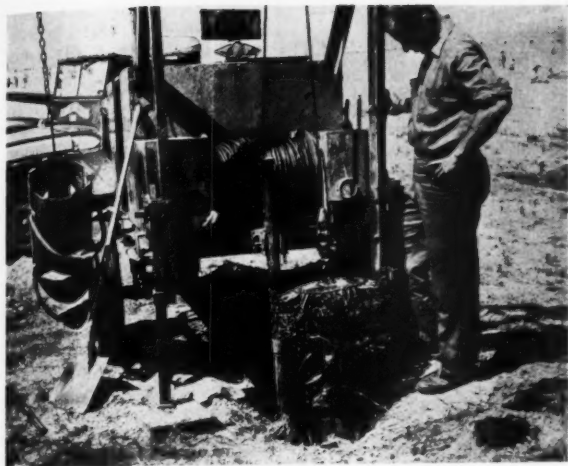
APPROVED BY LEADING MANUFACTURERS
Installed as original equipment or recommended as an approved accessory by leading construction equipment manufacturers. Ruggedly built — easy to install. See your factory branch, representative or distributor . . . or WRITE:

John W. Hobbs Corporation
2067 YALE BLVD. SPRINGFIELD, ILLINOIS
World's Largest Builders of Running Time Meters

HOBBS
Engine Hour
METERS

Pointer type illustrated;
now available also in
direct-reading models.





A wire brush is inserted into the line to remove all debris remaining after the bucket is withdrawn. The line is restored to design-capacity flow in a minimum of time as a result of this method.

apparent that because of the severe blockage, clearing with the district's equipment would be both time-consuming and costly. Only small-size rodding and auger equipment was available, and some of that was hand-operated. None of it was powerful enough to penetrate the densely packed sand that filled the drains. The proper bucketing equipment also was needed to do a thorough job of refurbishing the lines. And since maintenance crews already had a tight schedule of work, National Power Rodding was again called on to do the job.

The mile-long section of main drain they cleared in about a month, a short time considering that a typical 200-foot section contained as much as 5 cubic yards of sand.

Employing specialized pipe-cleaning engineers is an efficient and economical way of contracting work on severely blocked sewers. In this way, too, there is no need of investing in heavy-duty rodders, buckets, and power plants that might be used only occasionally. By restoring existing

lines to design-capacity flow in a minimum of time, the cost of building auxiliary lines and the problem of backups have been eliminated.

As municipal engineers know, the difference between the estimated cost and the eventual cost is often substantial. No matter how closely the cost is figured, something can happen to make it spiral upward. But the Chicago Park District has found that National Power Rodding's proposal price has been the final price, and as a result, special sewer-maintenance work has been substantially economized.

With the contractor's manpower and equipment available on a "where-and-when-needed" basis, the Park District has saved sizable amounts of time and money on special maintenance jobs.

These benefits have convinced the district that employing a special sewer-maintenance contractor results in consistent and substantial savings of both time and money and has simplified serious rodding problems.

THE END

KONKURE Concrete Curing Compounds

Spray application curing membranes for freshly finished concrete surfaces — meets all city, county, State and Federal specifications.

Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures* or rainfall damage.

*In hot, dry areas, use of Konkure White is especially recommended.

GENERAL PURPOSE

KONKURE Clear — for curing concrete where retention of natural color is desired — a fugitive orange dye is used in Konkure Clear to insure application visibility — the color disappears within an hour.

KONKURE White — architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

KONKURE Black — an asphalt base waterproofing and curing compound competitively priced — also serves as a bonding agent for asphalt tile application.

KONKURE Gray — glare reducing — gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.

TILT-UP and LIFT-SLAB

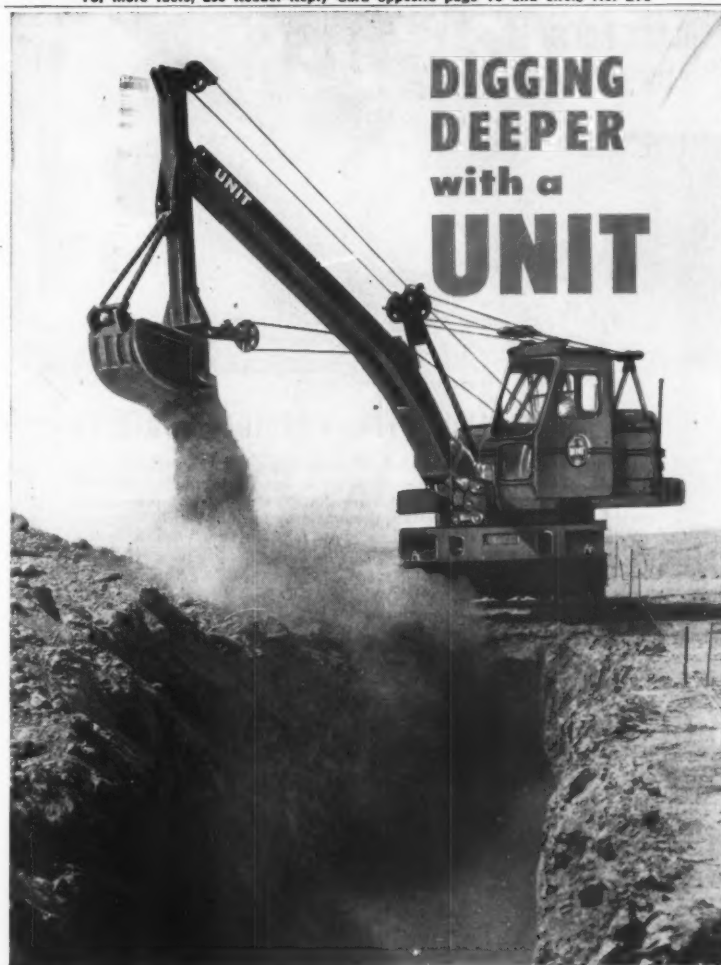
KONKURE P. C. C. — a resin base curing compound and bond breaker combined — may be painted without treatment upon erection.

Write or Phone for Full Information

KONKURE COMPANY

6742 Stanton Avenue, Buena Park, California • Phone LAwrence 2-2841

For more facts, use Reader-Reply Card opposite page 18 and circle No. 296



You'll Dig More Jobs At More Profit With A UNIT TRENCHER!

Accurate deep digging of trenches for pipelines, sewers, water connections, footings, basements and culverts is easily and quickly accomplished with a UNIT Trencher. The "Goose-neck" boom with its long deep reach assures maximum production. Also saves time trimming vertical sidewalls and corners, and in leveling floor surfaces. Powerful... Compact... Perfectly Balanced. Every UNIT is designed to meet the most rigid demands. Investigate today and earn more pay.

UNIT models are available in 1/2 or 3/4 yard Excavators... Cranes up to 20 tons capacity... Crawler or Mobile types... Gasoline or Diesel. Ask for literature.

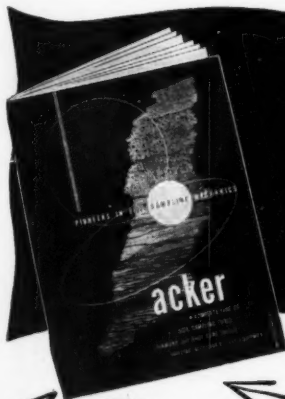
UNIT CRANE & SHOVEL CORPORATION
6309 W. Burnham St. • Milwaukee 14, Wis., U. S. A.

Geared to Produce Maximum Yardage



For more facts, use Reader-Reply Card opposite page 18 and circle No. 297

FREE! SOIL SAMPLING CATALOG



OVER 80 ILLUSTRATIONS

33 YEARS IN THE MAKING

This complete, instructive collection of information about soil sampling in all sub-surface conditions, shallow or deep, with hand or power driven tools, is yours for the asking. Modern sampling techniques are discussed with recommendations as to tools and accessories best suited for fast, accurate, economical sampling.

Use the coupon or write for Bulletin 25.

Send me my free copy of Bulletin 25.

Name _____ Title _____

Firm _____

Street _____

City _____ State _____

REMEMBER, Acker also makes a complete line of Diamond and Shot Core Drills, Drilling accessories and equipment.

ACKER DRILL COMPANY, INC.
Scranton, Pa.

Pioneers in Soil Sampling

For more facts, use coupon or Reader-Reply Card opposite page 18 and circle No. 295

MARCH, 1956

Oil, air, fuel filters

■ A catalog from Fram Corp. gives a complete listing of the right oil, air, and fuel filter to be used on trucks and other equipment. Tables give an alphabetical listing of manufacturers, their machinery, and the correct Fram filter to use. Replacement cartridges, fittings, brackets, and gaskets are pictured. Carburetor and crankcase air filters, diesel fuel oil filters, gasoline filter, and positive crankcase ventilators are shown and described. Complete specifications accompany each item.

To obtain this catalog write to Fram Corp., Pawtucket Ave., Providence, R. I., or use the Request Card at page 18. Circle No. 55.



One man stationed at the cement batcher operates the new Butler Bin automatic batching plant.

Automatic controls and portability are features of new batching plant

■ Push-button batching control and outstanding portability are the chief features of the Butler Bin Co.'s new automatic Roadbuilders' Plant. The new plant batches sand, cement, and two sizes of stone automatically and simultaneously. Its operating speed reportedly allows it to pace two 34E dual-drum pavers.

Batching of all materials is controlled by one man, stationed at the cement batcher, who operates a set of push buttons. The truck driver can also operate the sand and aggregate batchers separately without leaving the cab through push-button controls mounted on the bin columns.

Interlocking gates prevent discharge until the correct weight is in the hopper; the hopper cannot be charged until all material is out. Master controls governing the preset selected and specified batch proportions are at the rear of the bin.

For portability, the bulk cement bins have hinge and pin attachments for the supporting column that can be attached on the ground, the columns swinging into place as the crane lifts each bin. On the aggregate bins, bracing is preattached to two sets of panels for easy field bolting. The complete batcher is shipped as a self-contained package, with all wiring remaining intact in transport.

For further information write to Butler Bin Co., Waukesha, Wis., or use the Request Card at page 18. Circle No. 81.

Floating strainer protects dewatering pumps

■ New literature from Fol-Da-Tank Co. describes its Float-Dock dual-use strainer that floats above sand and muck and below scum and debris to protect pumps in dewatering operations. Keeping sand, gravel, or debris from entering the pump, the Float-Dock strainer protects impellers, packing, and bearings from abrasion. A diagram shows how the strainer's intake floats where the water is cleanest. The unit continues in service down to the last 5 inches of water.

To obtain this literature write to Fol-Da-Tank Co., P. O. Box 361, Rock Island, Ill., or use the Request Card at page 18. Circle No. 51.

Materials conveyor

■ The new lengths and discharge heights of the Marion Mule builders' conveyor is described in a bulletin from the Marion Mfg. Co., Marion, Ohio. Previously offered in a maximum standard length of 40 feet, the Mule is now available in 22, 32, and 42-foot lengths and has a maximum discharge height of 30 feet above ground level.

Bulletin 551 also shows a two-handed steel container for elevating mortar, sand, concrete, and other materials. The box can be slid to the ground on a taut cable for refilling.

To obtain this literature write the company, or use the Request Card at page 18. Circle No. 35.

BLAST HOLES UP TO... 30' DEEP

PHOTO COURTESY CATERPILLAR TRACTOR CO.

Carbide Rok-Bits—cross, "X" or chisel types—gauge sizes: 1 1/4" thru 6".

Alloy or carbon drill steel.

Most of the drill steel supplied by Brunner & Lay of Portland on this job.

DRILLED WITH CARBIDE ROK-BITS

Widening a 5.7 mi section of U. S. 95 near Riggins, Idaho called for the removal of nearly 430,000 cu yd of rock. Sub-contractor to Goetz & Brennan for blasting: Harding Blasting Co., Portland, cut costs by using carbide Rok-Bits. That's because Rok-Bits gave increased drilling speed with few bit changes in ground varying from very hard to soft basalt. For quick help with your drilling problems, call our nearest plant. Write for Bulletin B-1.

Brunner & Lay Products

<p>Brunner & Lay, Inc. 9300 King St. Franklin Park, Ill.</p>	<p>Brunner & Lay Rock Bit of Philadelphia, Inc. 2514 E. Cumberland St. Philadelphia 25, Pa.</p>	<p>Brunner & Lay of Los Angeles, Inc. 2425 East 37th St. Los Angeles 58, Calif.</p>
<p>Brunner & Lay, Inc. 150 Leslie St., Dallas, Texas</p>	<p>Brunner & Lay Rock Bit of Asheville, Inc. Sweeten Creek Road, Asheville, N.C.</p>	<p>Brunner & Lay of Portland, Inc. 660 N. Tillamook St., Portland 12, Ore.</p>

For more facts, use Reader-Reply Card opposite page 18 and circle No. 298

HOT PATCHES made FAST

WITH WISCONSIN-POWERED Patchmobile

Here is a complete, mobile asphalt-repair unit, designed to produce hot asphalt materials equal to mixes of large stationary plants... made quickly, on the job-site. Its one-unit design means less equipment and greater operating economy in the maintenance of roads and streets, according to the builders, Wylie Mfg. Co., Inc., Oklahoma City, Okla.

A Wisconsin HEAVY-DUTY Air-Cooled Engine provides dependable, all-weather power. Features include tapered roller bearings at BOTH ends of the crankshaft; pump-circulated lubrication with individual oil stream to connecting rod (other parts lubricated by oil spray); high tension rotary type OUTSIDE Magneto, equipped with Impulse Coupling for quick starts in any weather, plus efficient AIR-COOLING from sub-zero to 140° F.

YOU can't do better than to specify "Wisconsin Power" for YOUR equipment. Write for Folder S-165.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 299

McConnaughay

HOT ASPHALT MIXERS

New Heavy-Duty, HTD-800
... up to 10 tons hot mix, 30 tons cold mix per hour

HTD-500 ... up to 7 tons hot mix, 15 tons cold mix per hour

HTD-B ... up to 5 tons hot mix, 10 tons cold mix per hour

HTD-8 TRUCK MOUNT ... up to 5 tons hot mix, 10 tons cold mix per hour

... for resurfacing and patching in any season

Designed for economy of operation and fast production, the McConnaughay line of Asphalt Mixers meets every need for most resurfacing as well as all types of pavement patching. Working on location, McConnaughay HTD Mixers provide the exact amounts of materials needed and effectively remove both moisture and solvents from bituminous mixtures... positive assurance that patches and resurfaced areas will set up hard. For details and specifications on the mixers above and on the JR and HTD-LP models (not illustrated), write, wire or 'phone...

ASPHALT EQUIPMENT CO., INC.
3929 Buell Drive, Fort Wayne, Indiana
National distributors for
K. E. McConnaughay, Lafayette, Ind.

For more facts, circle No. 300

CONTRACTORS AND ENGINEERS

New 15-ton crane travels at 21 mph

A wheel-mounted version of the Model 205 excavator, the Cruiser crane, has been announced by the Koehring Co. The crane has a 15-ton capacity rated 85 per cent of tipping, 1/2 cubic yard dipper capacity, and a top travel speed of 21 mph. It can lift a load of 12.7 tons, without outriggers, and travel, negotiating 25 per cent grades in low gear.

One man handles the 205 Cruiser from the same control position for both travel and work. One engine supplies all power, and a 4-wheel drive unit provides extra tractive power. Other features include power steering, air-hydraulic brakes, and a standard torque converter for smooth operation and improved gradability. The unit has a short turning radius of 27 1/2 feet.

The machine's all-welded chassis provides stability for crane and clam-shell work, and front and back outriggers give extra support during stationary lifting operations. The turntable swings on 4 adjustable hook rollers that resist tipping in either direction. The standard 25-foot boom can be lengthened to a maximum of 55 feet and straight boom jibs of 15 to 30 feet can also be added. Safety boom limit and power boom lowering are standard.

There are only two major shafts on the upper machinery assembly—the swing and traction, and the main drum. Extra large clutches are of the internal expanding type. Total weight of the crane is 29,400 pounds. The rear axle load without counterweight is less than 18,000 pounds, conforming with highway regulations.

For further information write to Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 129.

Diamond saw blade will not load-up

A diamond saw blade that is non-ductile, and therefore will not load-up under the high heat and friction of concrete and masonry cutting, is offered by Consolidated Diamond Tool Corp. The company's carbide bond blades are available in three bond hardnesses.

It is claimed that, because of the blade's ductility, the three types now cover a wider range of performance than that of conventional blades.

For further information write to Consolidated Diamond Tool Corp., 230 Yonkers Ave., Yonkers, N. Y., or use the Request Card at page 18. Circle No. 141.

Esco organizes new central sales district

The Electric Steel Foundry Co., Portland, Oreg., has formed a new central sales district in Danville, Ill. The district will handle the sale of Esco construction machinery, logging, and sawmill equipment in the area east of the Rockies. The office, is located at 1017 Griggs St., Danville. Tom P. Kirby is manager of the new district.

Highly maneuverable, the new Cruiser Crane version of the Koehring Model 205 excavator is especially recommended where heavy loads must be moved often.



Catalog on weed killers

Three types of weeds that hinder roadside maintenance and chemical dusts and sprays that may be used to kill them are detailed in literature from Chipman Chemical Co., Inc. The results to be expected and precautions to be taken with the chemicals are described. A chart illustrates how much is needed to kill the weeds on one acre, and which is the best chemical to use for any particular weed.

There are 16 pictures with a brief description of the most common weeds.

To obtain this literature write to Chipman Chemical Co., Inc., 44 Factory Lane, Bound Brook, N. J., or use the Request Card at page 18. Circle No. 98.

ROCKFORD

New MORLIFE* CLUTCHES and CLUTCH PLATES Give—

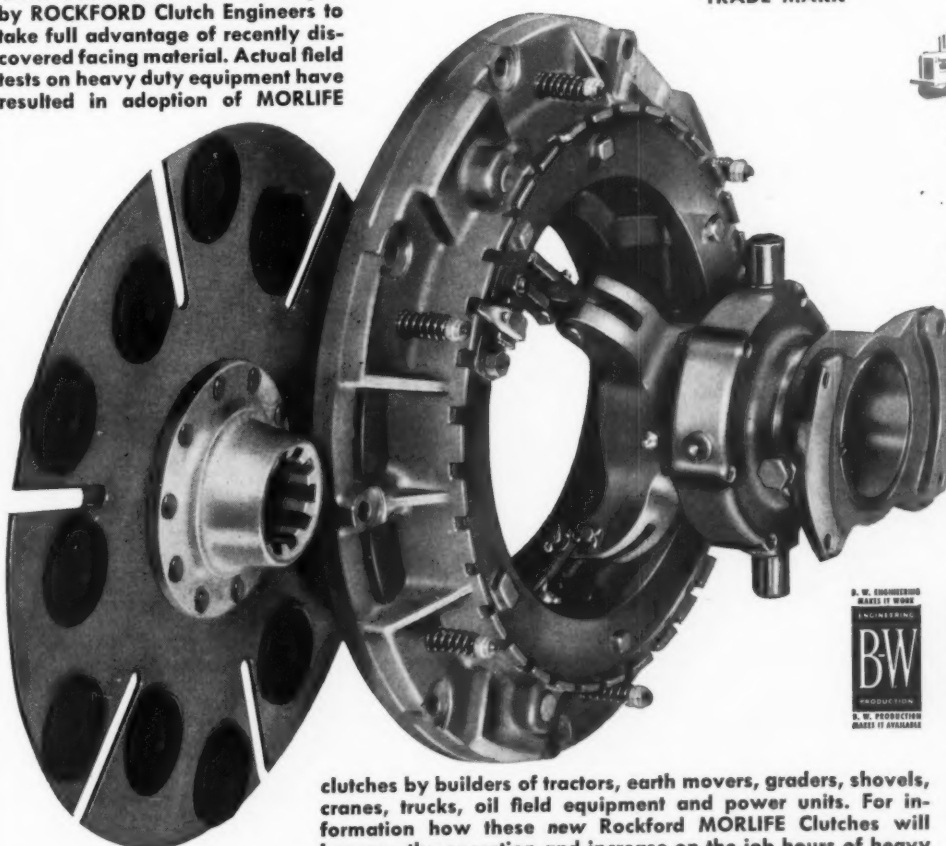
MORE Clutch Life (400% MORE)

MORE Torque Capacity (100% MORE)

MORE Heat Resistance (50% MORE)

These new ROCKFORD Clutches and Clutch Plates have been developed by ROCKFORD Clutch Engineers to take full advantage of recently discovered facing material. Actual field tests on heavy duty equipment have resulted in adoption of MORLIFE

*TRADE MARK



clutches by builders of tractors, earth movers, graders, shovels, cranes, trucks, oil field equipment and power units. For information how these new Rockford MORLIFE Clutches will improve the operation and increase on-the-job hours of heavy duty machines, write Department E.



"MORLIFE clutch has gone 851 hours without slipping or adjustment."



"MORLIFE clutch going strong after 1695 hours, working in sand."



"MORLIFE clutches last 950 hours longer, without adjustment."



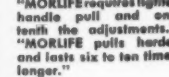
"MORLIFE clutch needs adjustment once a month, instead of daily."



"MORLIFE requires lighter handle pull and one tenth the adjustments."



"MORLIFE requires lighter handle pull and one tenth the adjustments."



"MORLIFE pulls harder and lasts six to ten times longer."



"Won't buy a unit that isn't equipped with Durable MORLIFE clutch."



ROCKFORD Clutch Division BORG-WARNER

314 Catherine Street, Rockford, Illinois, U.S.A.

CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 301

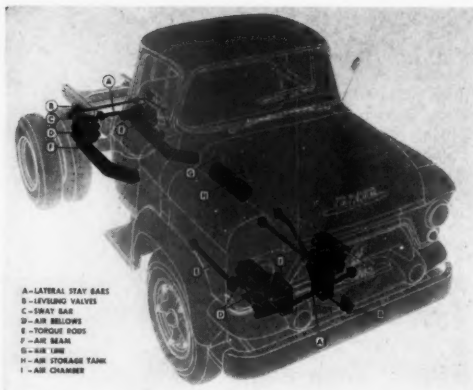
Air-ride suspension for heavy truck-tractors

■ GMC truck tractors with a new type of air suspension, in which air-filled rubberized bellows replace the conventional metal leaf springs, are planned for production late this year.

Air-ride suspension eliminates spring lubrication, repairs, and replacement; provides a smoother ride by absorbing vibration and road shocks; reduces cargo breakage; and increases trailer payload capacity by lowering the truck floor height. This also facilitates loading and unloading, and results in improved load distribution.

The system also compensates for poor load distribution. Even with a partial load concentrated to one side

This phantom drawing shows the basic components of the suspension system of GMC Truck and Coach Division's experimental air suspension tractor. Air-filled rubberized bellows replace conventional leaf springs in the GMC experimental tractor-trailer combination and the vehicle literally rides on air.



A-LATERAL STAY BARS
B-LEVELING VALVES
C-DRIFT BAR
D-AIR BELLOW
E-TORQUE RODS
F-AIR BEAM
G-AIR TANK
H-AIR STORAGE TANK
I-AIR CHAMBER

of the trailer, the floor remains level because the air springs on that side of the trailer automatically are subject to more air pressure and compensate

for the unbalanced load.

The constant tractor-trailer height is also expected to increase trailer cubic-foot capacity, as trailer manu-

facturers could build trailers to the maximum legal height of 12½ feet without leaving deflection space between the full-loaded and empty trailer height.

By easy adjustment of air spring pressure to throw more load weight on the driving axle, air-suspension permits greater traction when needed under the driving axle of tandem-axle combinations using a "dead" pusher or trailing axle.

In a typical installation on a tractor-trailer combination, the tractor has a total of six bellows, four in front and two over the rear axle. Two small bellows are mounted on each end of the front axle and a large bellows is installed at each end of the rear axle. Four large bellows support the trailer, two on each side of the trailer between the rear axle and the trailer's body.

Compressed air is supplied to the bellows, air beams, and air chambers from the tractor's air system. It flows from the storage tank through leveling valves. Air is available to the air-suspension system from the supply tanks only when pressure has been developed to maintain a safe margin for the air brake system.

For further information write to GMC Truck & Coach Division, General Motors Corp., 660 S. Boulevard East, Pontiac, Mich., or use the Request Card at page 18. Circle No. 128.

Line of bin units

■ The Bin-Flo aerator unit and the Roto-Bin-Dictator may be easily installed on any type bin, according to literature from The Bin-Dictator Co. The aerator unit is designed to provide uniform and continuous flow of finely ground cement and aggregate from bins, hoppers, and chutes. Recommended air pressure for the Bin-Flo is 1 to 5 psi. Diagrams show the unit installed on bins with conical, pyramidal, and flat bottoms; and on thin and thick-walled bins.

Flow charts illustrate the operation of the Roto-Bin-Dictator, which has the ability to work with any material, and in any position. With dustproof switch housing and cast-iron motor, the unit operates on a 100 volt 60-cycle synchron timing motor.

To obtain this literature write to The Bin-Dictator Co., 13946 Kercheval Ave., Detroit 15, Mich., or use the Request Card at page 18. Circle No. 89.

Grid-type rollers

■ Two bulletins highlight the Hyster grid roller for compaction of earth fills and for salvaging bituminous pavement. Job statistics cited claim a 111.7 per cent density in five passes on a highway job, and better compaction at higher speeds. A cutaway picture shows the principle of the roller. Step-by-step photos show how all aggregate and re-usable binder can be salvaged by the roller. Complete specifications and outstanding features are given.

To obtain these bulletins write to Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 29.

CAST • STRIP • LOAD • TERRACE

WITH YOUR
GALION
AND A
**B & L ELEVATING
GRADER ATTACHMENT**

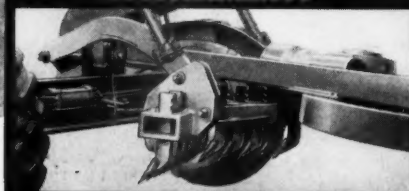
With this combination, **ONE MAN** can keep a fleet of trucks working all day long, or cast more dirt than any other group of machines — and with less manpower requirements and cost of operation.

A heavy-duty power take-off is connected direct to the engine crankshaft of grader through V-belt drive and disc clutch controlled from grader cab. This control is furnished with the attachment. All other operations utilize the standard hydraulic controls on your GALION Grader. The standard 16-ft. carrier is easily extended by inserting one or two 3-ft. sections. This attachment is easily removed to convert grader for normal operation.

For more-than-ever profitable use from your GALION Grader, add the multi-purpose B & L Elevating Grader Attachment. Write for literature.



OTHER GALION GRADER ATTACHMENTS



HYDRAULIC SCARIFIER

V-type with eleven teeth mounted in a heavy box-type block of welded construction. Teeth are made of tough steel and have renewable heat-treated points. A valuable attachment for tearing up old pavements or reworking old gravel road surfaces to remove chuck holes, ruts, etc.

Other Galion attachments include: Creeper Transmission • Hydraulic Shiftable Moldboard • Snow Plow and Wing • Bulldozer • Right or Left 2-ft. Moldboard Extensions • Enclosed Cab • Write for literature.

ESTABLISHED
GALION
1901

MOTOR GRADERS • ROLLERS



TRENCH ROLLERS PORTABLE ROLLERS 3-WHEEL ROLLERS TANDEM ROLLERS MOTOR GRADERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 302



The Carlon "D" pipe can be compressed to 75 per cent of its normal diameter and still return to its original form.

New drain pipe resists moisture and corrosion

■ A new lightweight plastic pipe for use in sewers and drains is available from the Carlon Products Corp., 10225 Meech Ave., Cleveland 5, Ohio.

Known as Carlon "D", the pipe resists moisture and corrosion. It can be compressed to 75 per cent of its normal diameter and still return to its original form.

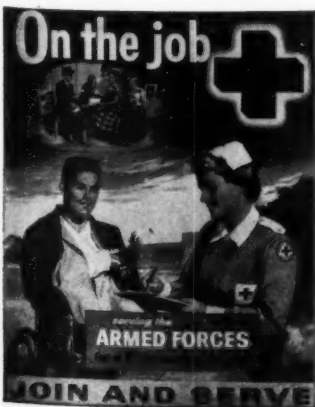
Available in 10-foot lengths in 2 to 6-inch sizes, the pipe comes with a complete line of reducers, adaptors, and couplings for special sizes and angles.

For further information write to the company, or use the Request Card at page 18. Circle No. 102.

Ignition systems

■ Various magneto ignition systems for tractors, power units, pumps, chain saws, and other construction equipment are contained in a brochure from Wico Electric Co. The Model XH for small and medium size engines is a self-contained unit that needs no outside source of power. For 4 or 6-cylinder engines, flange or base mounted, the Model XHD is recommended. Model XVD is for engines and power units with distributor-type ignition mountings. A one-unit compact distributor, the Model XB is said to be ideal for long, tough service.

To obtain Form S-416 write to Wico Electric Co., Bliss and Western Aves., West Springfield, Mass., or use the Request Card at page 18. Circle No. 58.



Tagline winder

■ Tag Master, a combination tagline winder and dipper trip, is featured in a catalog from Morin Mfg. Co., Inc. A three-screw adjustment converts the Tag Master from one to the other in a few minutes, eliminating the need for separate tagline and dipper trip. The drum capacity for the four tagline models ranges from 60 to 135 feet of 5/16-inch cable. This unit may also be used as a haul-in-drum.

Specification data, advantages, pictures, and diagrams are included.

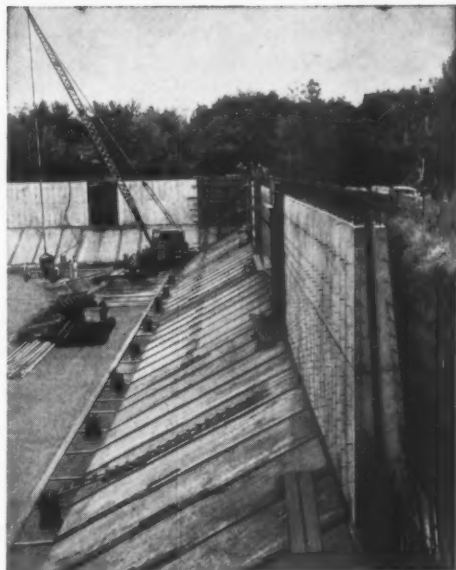
To obtain this catalog write to Morin Mfg. Co., Inc., 946 Elm St., West Springfield, Mass., or use the Request Card at page 18. Circle No. 71.

Symons Forms for Battered Walls

Battered walls are constructed similar to vertical walls, the only difference being a variation in the lengths. Ties are placed when inside form is erected . . . outside wall is locked to ties with the same connecting bolts and wedges that bind panels together.

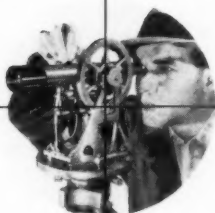
Symons Service includes the details of a forming job from start to finish. Form layouts and job cost sheets are provided upon request without charge or obligation. Attach this advertisement to your letterhead for complete information on Symons Forms and accessories. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. C-6, Chicago 39, Illinois.

Water Reservoir, Omaha, Nebraska, De Buse Bros., Form Erectors



For more facts, use Reader-Reply Card opposite page 18 and circle No. 303

Your Brunson Instrument Stays Accurate Where Others Fail!



DUSTPROOF BALL BEARING CONSTRUCTION Makes the BIG Difference!

As every experienced operator knows, the problem in surveying instruments has not been to get accurate instruments, but to maintain their accuracy and operability. It took Brunson, with a radical departure from old, "conventional" basic designs, to come up with the answer — dustproof ball bearing construction!

Located in the spindle and telescope axis, Brunson ball bearings are permanently lubricated by an all-temperature grease and sealed against dust and moisture. Preloaded and accurate to 5-millionths of an inch, these ball bearings provide highest possible instrument accuracy. With dust sealed out and lubricant sealed in, wear is practically eliminated by the smooth ball bearing action. That's why your Brunson instrument stays accurate and operable year-in-and-year-out, where others fail. You save hundreds of hours in on-work time, avoid costly errors, slash routine repair and maintenance expense to a level undreamed of in the past.

You pay no more for Brunson instruments with exclusive ball bearing construction. Mail coupon today.



Engineer's Transit Model 50

You Get These Advantages, Too!

Wobble Pin in Tangent Screw Point—Enables your Brunson instrument to stay "on point" by eliminating strain and wear points that cause slippage.

Long and Short Shots in Collimation—Long and short shots are all in exactly the same straight line. Sturdy, Heat Treated Cast Truss Standard—Can support over 200 pounds without bending or warping.

Extra-Strong Fiberglass Cross Wires. Sharp Focus, Coated Lens System. Wide Field of View. Flush Filled Graduations. Covered Replaceable Leveling Screws.



The New Standard of Excellence

Distributed Exclusively By



America's Leading Supplier of Engineering and Drafting Equipment

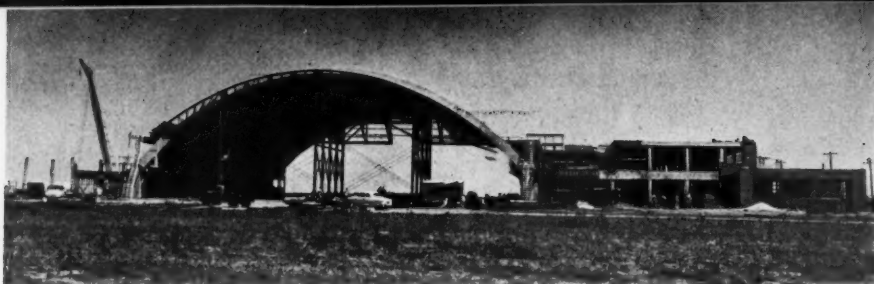


Charles Bruning Company, Dept. 34-R
4700 Montrose Ave., Chicago 41, Ill.

Please send me information on Brunson Surveying Instruments.

Name _____ Title _____
Company _____
Address _____
City _____ County _____ State _____

For more facts, use Reader-Reply Card opposite page 18 and circle No. 304



The steel falsework designed by C. H. Leavall & Co., Inc., El Paso, Texas, and fabricated by Lincoln Steel Works, Inc., Lincoln, Nebr., is in place for the concreting operations. The entire assembly, supported by jacks, is on flanged wheels that ride on rails to the next position.
Official U. S. Navy Photograph



The 150 x 240-foot hangar and the lean-to structures near completion. The light colored half of the roof was cured with Sisalkraft paper, the dark half with a sprayed-on asphalt-base compound.
Official U. S. Navy Photograph



PERFORMANCE TEST—NEW JERSEY TURNPIKE**

NEW CARBIDE BONDED* BLADES... ...TRIPLE ASPHALT FOOTAGE!

After years of research and development Consolidated Diamond Tool has been successful in blending diamonds in a carbide matrix. DIAMONDS... are the hardest, most durable of all materials. CARBIDE... is the toughest, most enduring of all metals. RESULT... the amazing Carbide Bonded, diamond asphalt and concrete cutting blade.

Careful analysis of field reports and tests, conclusively shows that the new Consolidated blade lasts 2 to 3 times longer than any other blade... every time. In asphalt the Carbide Bond blade more than triples normal footage. Longer blade life means lower costs... lower costs mean lower bids... lower bids mean more contracts, more profit.

At the start of the New Jersey Turnpike job, four sub-contractors were trying the blades of five leading manufacturers. At the end of the project all were using the new Consolidated blade exclusively. Performance is Proof.



Write today for full information and prices.

Consolidated
DIAMOND TOOL CORP.
320 Yonkers Avenue, Yonkers, N. Y.

*Patents Pending.

**Detailed N. J. Turnpike test available on request.

CONCRETE AND MASONRY CUTTING BLADE DIVISION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 305

Rolling hopper speedin-

Contractor tries two methods in placing concrete barrel-arch roof for Naval Air Station hangar

A specially designed rolling hopper, mounted on a traveling bridge, provided the solution to a tricky concrete-placing problem during work on the roof of the recently completed Naval Air Station hangar at Lincoln, Nebr. After placing half the thin-shell barrel-arch roof by pumping concrete from transit-mix trucks directly to the roof, C. H. Leavell & Co., Inc., El Paso, Texas, abandoned the method and substituted the special equipment to place concrete in the forms.

The \$1.5 million hangar, designed by Roberts & Schaefer Co., Chicago, Ill., and New York City, was built for the Ninth Naval District, Great Lakes, Ill. It is part of the air station's more than \$3 million construction program,

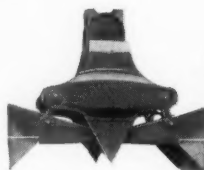
which includes a heating plant, public works building, flammable storage building, aviation-fuel storage facilities, paving, and utilities. The runways, and some of the other facilities, are used jointly by the Air Force, the Naval Air Station, and the Lincoln Municipal Airport.

The new hangar consists of a 150 x 240-foot hangar section covered by the thin-shell roof. On the west is a 60 x 240-foot lean-to, two stories high. Another two-story lean-to, on the east, measures 100 x 240 feet. Two single-story units, each 43 x 60 feet, adjoin the north and south sides of the east lean-to. The lean-tos, containing shops, offices, cafeteria, classrooms, and other training facilities, are of conventional concrete-frame

BROWNHOIST bridge and crane BUCKETS

we have the type and size to best handle the job, dependent on material and equipment

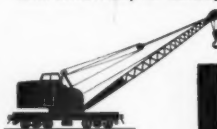
Open-type grab buckets and link-type buckets for bridge cranes, fast-plant unloaders and large gantry cranes are available in capacities from 35 to 400 cubic feet.



Because of their simplicity of design and rugged construction, Brownhoist buckets (such as the link-type left or the open type grab bucket above) withstand extremely severe abuse. Abrasion-resistant alloy steel nose plates protect against coarse materials.



Brownhoist clamshell buckets (right) in capacities from 1/2 cu. yd. to 3 cu. yds. are used with cranes for handling coal, ore, sludge, slag, rock or wet clay. They're engineered (as a result of over 80 years experience) to take full bites, year after year with trouble-free operation. Write today for catalog.

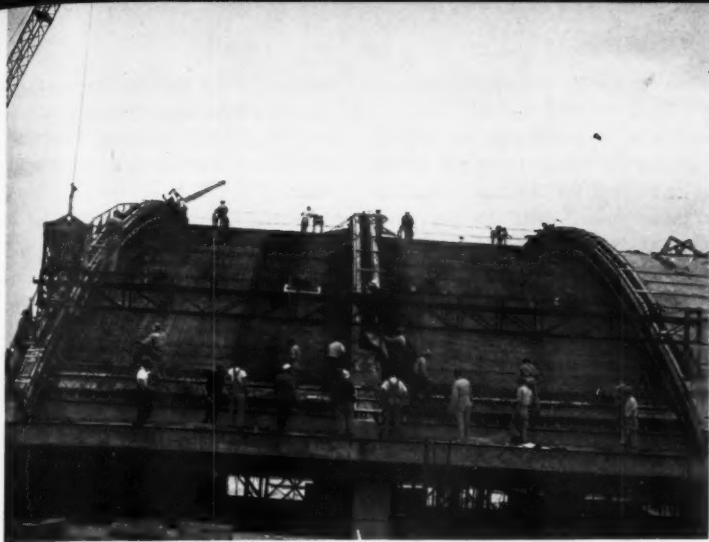


185-A

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 306

CONTRACTORS AND ENGINEERS



A Gar-Bro bucket is about to discharge concrete into the hopper, which is being rolled along the bridge toward the edge of the building by the workmen at center. Official U. S. Navy Photograph

eehin-shell roof pour

construction with brick and concrete-block walls.

The parabolic arch hangar roof has 16-inch-wide ribs tapering from a thickness of 4 feet at the ends to 3.25 feet at the center. Ribs are spaced at 30-foot centers with the 4-inch roof shell spanning between them. Each of the ribs terminates in a buttress column at the second floor level of the lean-tos. These columns measure 2.5 x 6 feet in section and rise 14 feet above the hangar floor level.

Founded on piling

Footings of the structure rest on Cobi concrete piling, poured in spiral corrugated steel shells. Each of the 18 footings under the big columns has 14 to 19 piles, all of them battered

to resist the outward thrust of the roof. Concrete footings 8 feet wide, 32 to 36 feet long, and 3 to 6 feet thick cap these piles and support the columns. Each lean-to footing has two to four vertical piles capped with concrete footings 2.25 feet thick. All of the piles were driven to 35 tons bearing.

The pile-driving operation was done under a subcontract by C. L. Guild Construction Co., Inc., East Providence, R. I. A Lima crane, carrying an upright boiler, drove the pile shells with a Vulcan No. 1 hammer in stationary leads. In this operation, Guild used a mandrel, made in four pieces, which was 3/4 inch smaller than the inside diameter of the 12-inch pile

(Continued on next page)



As the 3-foot-wide and almost 29-foot-long screed starts moving from the top of the lean-to up the concrete arch of the roof, finishers start working behind the strikeoff. Just above, the pouring bridge rides upward on the rib forms. Official U. S. Navy Photograph

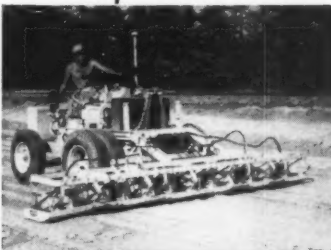
4200
TWO-TON BLOWS
PER MINUTE!



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COMPACTION

... for rapidly and most economically achieving or exceeding specified densities in the consolidation of rock, slag, gravel and sand base courses in waterbound and penetration macadam construction. The Jackson does it in just about half the time required with equipment of other types and is equally efficient in filling all the voids from top to bottom of rock and slag courses when sufficient fines have been spread.

Exceptional **ON-THE-JOB ADAPTABILITY!**



Above: a Jackson Multiple (6 units) on 7 mile sub-grade. Below: 2 units equipped with operating handle, self-propelling and easily operated by one man.



Standard width of the Jackson Multiple is 13', 3"; working speeds: up to 60' per minute; reverse: up to 5 MPH. Working width can readily be altered on the job to exactly suit narrower requirements such as widening projects. As many of the 6 compacting units as desired can be subtracted from the workhead, quickly and easily. Furthermore, easily interchangeable bases from 12" to 26" are available and individual compacting units may be fitted with operating handles and used exactly like the standard, highly popular, self-propelling manually guided Jackson Compactor. As a consequence Jackson equipment can be used on a great deal of work other machines cannot reach. If you have any job requiring compaction of granular soil, it will pay you to know specifically what Jackson Vibratory equipment will do. See your Jackson Distributor. Literature and name of nearest Distributor on request.

JACKSON
VIBRATORS, INC.
LUDINGTON, MICH.

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Save Time and Money

PLUMB FACE AND SIDE WITH ONE READING

Length	Wt.	Each
8"	2/3 lb.	\$ 9.95
16"	1 1/2 lb.	12.75

For Tubing

Masonry

Steel

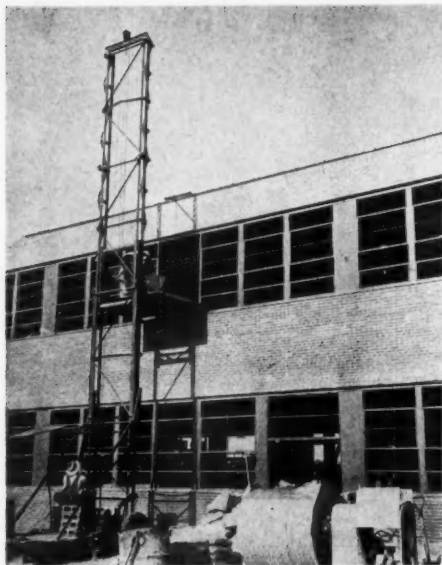
Wood

Boxed Individually

Over 38 years of experience in the manufacture of Levels.

MANUFACTURED BY PEERLESS LEVEL AND TOOL COMPANY, STERLING, ILLINOIS

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A Buck hoisting tower raises material to the upper floor of one of the two story lean-tos adjoining the hangar. These will house shops, offices, classrooms, and similar facilities. The mortar mixer, foreground, supplies workmen with mortar.

C&E Staff Photo

(Continued from preceding page)

shells. A nylon-reinforced rubber envelope was inflated with air at 125 psi to expand the mandrel and bring it into contact with the pile. The constant-diameter spiral-corrugated pile shells, with a driving shoe welded to the bottom ends, were extended to the required length by sections welded onto them. A total of 469 piles were driven an average of about 43 feet for a total of nearly 20,000 linear feet of piling below cutoff.

Before piling was driven, footing holes were excavated by a backhoe and concrete for the piles and footings placed directly from transit-mix trucks of the Ready Mixed Concrete Co., which has its West Lincoln plant adjacent to the air field. Footings and

columns were formed with plywood forms, which were backed by 2x4 studs and wales and tied with Richmond snap ties and other form hardware.

Part of the second floor slab of the lean-tos was placed monolithic with the arch columns, and part of the second-story roof was completed when concrete was placed for the transition arches. The square columns of the lean-tos were formed with 5/8-inch plywood backed by flat 2x4's and tied with steel column clamps. Floor beams, formed with 5/8-inch plywood on 2x4 joists and 4x4 stringers, were supported on 4x4 shores with Quick-Way adjustable shore clamps.

The remainder of the floor system consisted of Ceko steel pans. The 20x10-inch pans formed 5-inch-wide joists which spanned 30 feet between the beams. A 3-inch slab was cast over the pans. Pans were furnished and placed by Ceko Steel Products Corp., Chicago, Ill.

Concrete frames, including floors and roofs, were all placed by a Unit Model 1520 truck-crane and Gar-Bro 3/4-yard concrete bucket. Vibration was provided by Mall electric vibrators. When some of the concrete placement was done during cold weather, tarpaulins were used to protect the concrete. Heat was supplied inside the tarps by Silent Glow heaters.

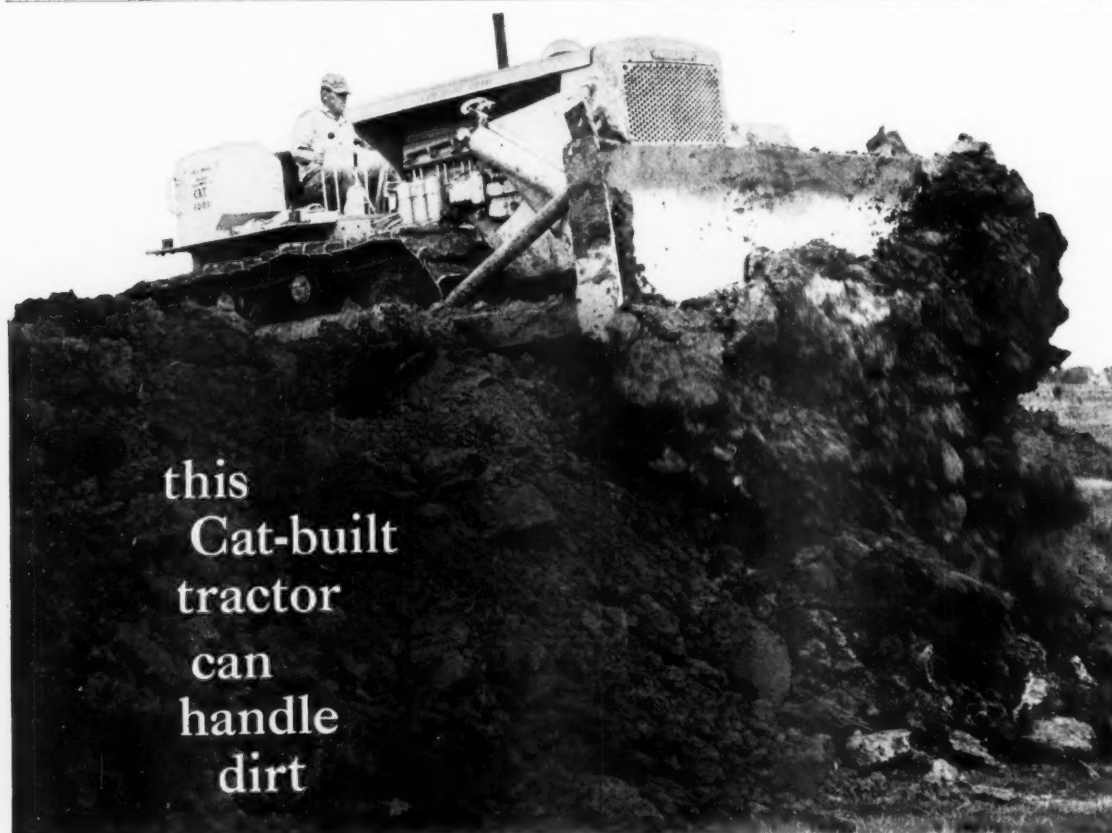
Forming and pouring arch

The arch roof was placed in four 60-foot-wide sections. Each section consisted of three arch ribs—one split rib at each end and one full rib in the center—and the roof shell.

The steel falsework supporting the form was designed by the Leavell Co. and fabricated by the Lincoln Steel Works, Inc., Lincoln, Nebr. Steel posts made of 12-inch wide-flange 40-pound sections, and 8-inch wide-flange 31-pound sections supported the main falsework trusses, which were fabricated of angles. Ties between the columns were 8-inch wide-flange beams, while the longitudinal struts consisted of I-beams with angle-cross bracing. When the truss was set in place for a pour, each column was supported by two Joyce 28-ton jacks. There were 30 of these 2 1/2 x 18-inch jacks in the complete assembly. When the form was being raised or lowered, each jack was manned by a workman.

When falsework was ready to be moved from one placing position to the next, it was lowered about 8 inches until it rested on flanged wheels riding on rails. The rails ran the length of the building and were supported on ties lying on the ground. A winch truck pulled the form along the rail from one position to another.

Steel bar joists resting on the top flange of the falsework trusses spanned between the trusses to support the deck form. The 5/8-inch plywood deck was attached to 2x4 nailing strips on the bar joists. The rib forms consisted of plywood sides backed by 2x4 studs and wales. On the initial pours, the rib forms were supported above the deck with snap



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Cat-built
tractor
can
handle
dirt

...with Caterpillar filter refills



Your Caterpillar dealer well knows the damage that dirt-laden oil can do to your tractor. Precision parts can be ruined in a matter of hours if unfiltered oil gets into the engine. That's why he always insists on giving you Caterpillar replacement filters. Built to meet the specific requirements of your engine by Purolator, they can handle all the volume your Cat-built tractor requires... they never let oil "by-pass" the filter... never let harmful abrasives enter the engine.

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PUROLATOR PRODUCTS, INC., Rahway, New Jersey, and Toronto, Ontario, Canada

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ties. Later, when the weight of the pouring equipment rested on the rib forms, the snap ties were replaced with short pieces of pipe. Outside rib forms were braced to a 4-foot overhang of the main form. Cables with turnbuckles served to tie the other rib forms together.

Initial placement of concrete was done by pumping. Transit-mix trucks dumped directly into a hopper. Six-inch pipe lines were strung up to the roof and arranged so that the discharge end could be swung back and forth to distribute the concrete across the width of the form.

Rib forms were filled first, and plywood covers were nailed over the top of the ribs in short sections as concrete placing progressed. The first two sections, placed in this way, were cured with Sisalkraft curing paper.

Change to rolling hopper

Because a number of difficulties were experienced in making the first two placements, the contractor decided to change the method of bringing concrete to the form. He designed and fabricated a pair of traveling bridges that spanned the entire 60 feet of the section being placed. These bridges were fabricated of channels and angles, and they rolled on wheels on the arch rib forms.

A specially designed $\frac{3}{8}$ -yard pouring hopper rolled from one end of the bridge to the other on small steel wheels which ride a pair of tracks on the bridge. Since the bridge could be adjusted to remain level at all times, the hopper was easily rolled along by hand. One bridge and hopper unit was used on each side of the roof.

As concrete was delivered to the site in transit-mix trucks, it was hoisted to the roof by cranes and buckets. On one end was a P&H truck-crane with a 1-yard bucket, while the Unit 1520 crane and $\frac{3}{8}$ -yard Gar-Bro bucket served the other end. The pouring hopper was filled at the end of the bridge, then rolled across the bridge to spread concrete the width of the deck. Three passes of the hopper carried the concrete 1 foot up the roof arch.

As placement progressed, the bridges were moved up the arch by six Beebe Bros. 5-ton hand winches mounted in pairs at the top of the arch ribs. When the bridges made an advance, the adjustable lower legs were shortened to keep the top of the bridge level.

After concrete had been consolidated by Mall electric vibrators, screeds 3 feet wide and nearly 29 feet long were pulled up the roof. These were pulled behind the pouring bridge by Beebe 5-ton winches operating independently of those raising the bridges. The backbone of each of these screeds was a pair of Ceko steel joists that spanned the 29-foot length. Three-foot joists, made of 2x4's cut to fit the average curvature of the arch, were attached to the Ceko joists, and a facing of Masonite $\frac{1}{4}$ -inch Tempered Presdwood was nailed to the 2x4's. Outriggers at the ends of the strikeoff rode under the edge of the rib forms to hold the strikeoff down to proper grade.

Finishers rode a special platform on the strikeoff to float and finish the concrete. The strikeoff was normally moved ahead about 2 or 3 feet at a time, giving the finishers that much of an area to work on while the next lift was being poured.

After the bridge and strikeoff had made a move, the rib forms were filled first and then the deck slab was placed. Techkote asphalt-base curing compound was applied as soon as possible after finishing operations. The work of placing the 183 cubic yards of concrete required by a section took from 8½ to 11½ hours. The last section placed was done in 8½ hours, reflecting the value of the experience gained by crews on the job.

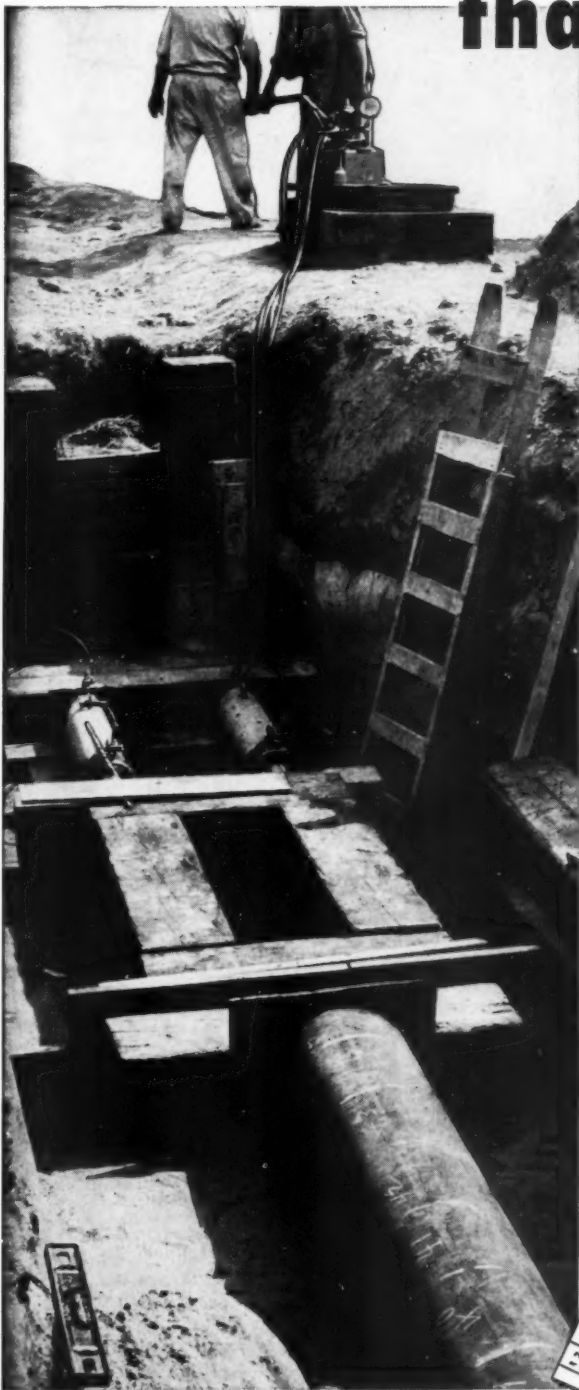
When the pouring bridges and finishers rode a special platform on the strikeoff to float and finish the concrete. The strikeoff was normally moved ahead about 2 or 3 feet at a time, giving the finishers that much of an area to work on while the next lift was being poured.

(Concluded on next page)



Inside the hangar, a Hough Payloader loads excess dirt to a Caterpillar DW10 scraper as the subgrade is made ready for the sand base that will lie under the concrete floor. Excess dirt is being hauled to a waste area. C&E Staff Photo

It costs less to PUSH PIPE than dig ditches



cut job costs and installation time . . .

USE RODGERS HYDRAULIC JACKING UNITS

You'll cut pipe laying expenses and do the job faster and better by pushing pipe under highways, railroad tracks, and other obstructions. You'll avoid time-consuming ditching, backfilling, tamping and paving operations that delay the job and roll up the cost.

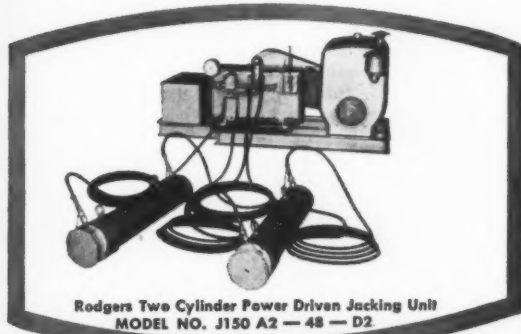
Rodgers Hydraulic Jacking Units can be used wherever you want to PUSH, LIFT or PULL. Multiple jack installations provide equal pressing or lifting power at all points and are ideal for raising or positioning large structural sections.

Photo shows a public utilities crew pushing a 16" diameter steel pipe in 16-foot sections through 44 feet of earth. Two 150-ton capacity, 30-inch ram travel, double-acting Rodgers Jacking Cylinders are doing the job. A hand operated Rodgers Hydraulic Pump furnishes equal power to both jacks.

Rodgers Jacking Cylinders used singly or in groups provide steady, precisely controlled power to jack steel casing, corrugated pipe or compressed concrete tile—and they can be used for all types of accurately controlled lifting operations on structures.

Rodgers Jacking Cylinders are available in capacities from 50 to 600 tons with standard ram travels from 6 inches to 48 inches. Longer ram travels to 72 inches available on special order. Tunnel contractors are invited to inquire about our special hydraulic equipment for tunnel shield construction which includes a series of special hydraulic cylinders, power pumps and controls.

A selection of hand or power operated Rodgers hydraulic pumping units offer the exact jacking combination needed for your job. Let Rodgers engineering department assist you in your selections.



Rodgers Two Cylinder Power Driven Jacking Unit
MODEL NO. J150 A2 - 48 - D2



Send for your free copy of Rodgers Bulletin, 317A.

It contains a complete description of Rodgers Hydraulic jacking units, quick couplers, valves and hoses, also a description of hydraulic equipment used in the construction of tunnel shields.



---Rodgers Hydraulic Inc.

7415 WALKER ST., MINNEAPOLIS 16, MINN.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 310

(Continued from preceding page)

ishing equipment working on either side of the roof reached the top at the completion of the concrete placement, they were left in place until the concrete had cured for two or three days. Then they were rolled down the ribs to the roofs of the adjacent lean-tos and moved along to the next position.

Radiant heating in floor

The floor of the hangar is a reinforced-concrete slab 11 inches thick, with thickened edges at the center joint and adjacent to the doors at the ends. The floor was placed on a 7-inch sand base over the natural ground. Heating coils for the high temperature hot-water radiant heating sys-

tem were embedded in the floor, and these and the reinforcing steel complicated the placement of concrete.

Grading for the floor was done by a Caterpillar No. 12 motor grader and a Hough Payloader, the latter loading the excess material into a Caterpillar DW10 scraper hauling to a waste area some distance from the hangar. After the sand base was placed, and forms set for the 20-foot floor strips, concrete was placed directly from transit-mix trucks operating from adjacent strips. Troweling was done with Whiteman cement floor finishers.

The exterior of the building is finished with face brick backed with concrete blocks. While a Buck portable hoisting tower was set up beside the lean-tos to raise mortar, roofing, and other materials to the second and

roof levels, a Fairfield conveyor equipped with chains and flights carried bricks and blocks from the ground to second floor and higher levels as the masonry work progressed. Mortar was supplied to workmen by Rex mortar mixers.

Both ends of the hangar are equipped with 35-foot-high mechanical doors that open to the full 150-foot width of the hangar. These were furnished and installed by Allison Steel Mfg. Co., Phoenix, Ariz. The open end between the top of the doors and the arch was closed with steel framing and corrugated asbestos siding. The maximum clearance under the center of the arch is 52 feet.

Major quantities for the hangar and lean-tos included 6,380 cubic yards of concrete, 6,075 cubic yards of

excavation and 550 tons of reinforcing steel. The job also included a two-level monorail system, radiant heating, and sprinkler system in the hangar and fin-type radiators and a ventilating system in the lean-tos.

Built up roofing was applied by Standard Roofing & Materials Co., Oklahoma City, Okla. The flat roofs of the lean-tos have standard built-up, gravel covered roofs with 1-inch insulation. The arch has 1 inch of insulation followed by a built-up roof. Plumbing and heating facilities were installed by the Natkin & Co., Lincoln, Nebr., and electrical installations were done by Commonwealth Electric Co., St. Paul, Minn.

Personnel

Resident Officer in Charge of Construction for the Ninth Naval District was Lt. R. W. Loomis, CEC, USN, who was assisted by construction engineer Ivan C. Mathews. Commander F. H. Holt is the Commanding Officer of the Lincoln Naval Air Station.

Project managers for C. H. Leavell & Co. were C. G. Marrs and Paul Nigh. Marrs supervised the work during the 1954 season and Nigh took over in 1955, to complete the job in November. Arthur Senkbeil was job superintendent.

THE END

Lubricant additive

■ An industrial lubricant additive for conventional oils, greases, and lubricant compounds has been developed by Destiny Products Co. The manufacturer claims that the additive will increase the efficiency and life of engines, drives, transmissions, gear assemblies, compressors, and other equipment and tools. It does so by improving and extending the service life of lubricants.

Called Hyperoil, the additive is said to retain its characteristics at temperatures from minus 100 degrees to plus 400 degrees F. Non-corrosive, this lubricant additive also acts as a metal preservative and rust preventative. It is said to be adhesive to porous and dense surfaces.

Hyperoil is marketed in quantities from one quart to 200 gallons.

For further information write to Destiny Products Co., 2970 W. Grand Blvd., Detroit 2, Mich., or use the Request Card at page 18. Circle No. 146.

Method of piping

■ The Victaulic method of piping is shown in a 32-page catalog. A full-page chart is devoted to the complete specifications of couplings for steel, wrought iron, and spiral pipe with grooved ends, and for aluminum, brass, and plastic pipe in many sizes. Various fittings, elbows, threaded branch, reducer, and adapter nipples are detailed in charts. A whole section features cast-iron pipe and its applications. Tables give complete cast-iron pipe sizes, groove dimensions, shoulder dimensions, and coupling data.

To obtain Catalog 55 write to Victaulic Co. of America, P. O. Box 509, Elizabeth, N. J., or use the Request Card at page 18. Circle No. 93.



OWNER AND OPERATOR AGREE:

Allis-Chalmers HD-16C torque converter tractor works longer, works faster, produces more

Dozing and pulling a scraper in rock-like shale, the HD-16C owned by Murray Construction Co., Waverly, Ohio, is relocating route 73, northwest of Peebles. On one stretch of road, fill being hauled 1200 ft by the 150-hp crawler and a 15-yd scraper will raise highway grade where it crosses a valley.

More Yardage per Dollar

Co-owner Robert Murray has this to say about the new HD-16. "The tractor is a speedy worker and the torque converter is one of the reasons. We also find we haul more yardage for each dollar spent. And the time saved in not greasing track rollers daily should increase our profits."

Operator Kenneth Austin added this: "Our former tractor would stall loading rock like this, but the '16' goes right through. The torque converter saves clutching and makes it a lot easier for me. At the end of a day's work I'm not nearly as tired."

Saves Half Hour Greasing Time Daily

"I get more production because I put in an extra half hour a day hauling and dozing instead of greasing track rollers. I can haul and dump three 15-yd loads in that time and that amounts to 225 yd of extra pay load every week."

★ ★ ★

An HD-16 gives you more power for bigger jobs... plus more effective use of power, with a brand new Allis-Chalmers diesel engine and your choice of two great drives — the job-proved torque converter or the easy-shift standard transmission. But that's not all — you get many more advanced basic design features such as all-steel, box-A main frame and one-piece steering clutch and final drive case... unit construction... and timesaving, simplified lubrication and service designed with better maintenance in mind.

All in all, an Allis-Chalmers HD-16 brings you a top combination of performance and long life with mounted or drawn equipment... a higher rate of production, more working time, lower job costs.

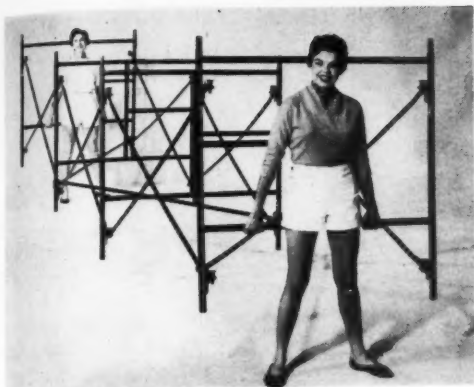
ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Talk to your Construction Machinery Dealer today

ALLIS-CHALMERS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 34



Thanks to modern lightweight design, two girls can carry enough Waco scaffolding (center) to support a 2,400-pound load.

Light scaffolding holds 40 times its weight

■ Lightweight scaffolding, capable of supporting up to 40 times its own weight, is now being made by Waco Mfg. Co., 3555 Wooddale Ave., Minneapolis 26, Minn.

Rated at 50 pounds per square foot, the 4x4-foot scaffold frames feature the Speedlock method of attaching braces and built-in ladders. The low weight of the scaffolding makes storage and transport of the frames easier, according to the manufacturer. Braces are of the tubular, pivoted type, and like frames, are made of high-carbon steel tubing. A complete line of accessories is also available from the manufacturer, including casters for making rolling towers.

For further information write to the manufacturer, or use the Request Card at page 18. Circle No. 39.

Rotary compressor line now has 210-cfm model

■ A portable rotary compressor with a rating of 210 cfm completes Worthington's Blue Brute line. This line also includes compressors of 125, 315, and 600-cfm sizes.

The new compressor incorporates the same basic features as the other units—a newly designed clutch and a separate oil reservoir equipped with a preheater. These two features are said to assure immediate cold-weather starting.

Easy maintenance and inspection of parts is a further advantage. Cylinders now have gravity-draining designed to prevent "lock" and the danger of oil accumulation.

For further information write to Worthington Corp., Harrison, N. J., or use the Request Card at page 18. Circle No. 111.

Sealing compounds

■ Presstite sealing compounds and Permugum tape, for curtain wall porcelain panelling and expansion joints, are detailed in a bulletin. To illustrate their uses, the company used the RCA Cherry Hill project, located outside of Camden, N. J. Photos and drawings show construction details and applications.

To obtain this bulletin write to Presstite Engineering Co., 3798 Chouteau Ave., St. Louis, Mo., or use the Request Card at page 18. Circle No. 11.

THE KEN ROLL



Works within 1/2" of wall or post—eliminates much costly hand tamping

Handiest 1 1/2 ton roller ever built

Weighs 1600 pounds empty and over 3,000 pounds with water ballast. Compacts to within 1/2" of wall on right side. Drive roll 30 1/2" dia. x 36" wide. Split steering roll 20 1/2" dia. x 30" wide. Single lever controls forward and reverse motion through constant mesh transmission—insuring smooth starts.

Contractors enthusiastic about economy and are coming back for more. Low, modern trailer available for hauling.

Write for detailed specifications and price!

PFAHLER MANUFACTURING CO.
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PROVE HENDRIX BUCKETS BEST

A TYPE FOR EVERY DIGGING PURPOSE

1/4 to 40 Cubic Yards



All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

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An artist's conception of Brownlee Dam on the Snake River in Idaho. Being built by Morrison-Knudsen Co., Inc., for the Idaho Power Co., the \$63 million dam will generate 360,000 kw and be one of the 15 highest in the world. ▶

BOOM LINES by VULCAN

HOW ABOUT THAT! DID YOU SEE THE WAY THIS PORTABLE VULCAN SUNK THOSE POSTS!

SURE DID! YOU OUGHT'A WATCH IT DRIVE 6" PIPE OR SHORING TOO! THE BOSS SURE GETS HIS MONEY'S WORTH OUT OF THIS PILE HAMMER!

COME ON. LET'S LOAD IT ON THE JEEP. THEY NEED IT ON THE OTHER PROJECT.

THE BOYS ARE RIGHT! OUR NEW VULCAN DGH-100 PORTABLE PILE HAMMER... REALLY PAYS OFF! IT DOES SO MANY JOBS, AND WE CAN USE IT ALMOST ANYWHERE EVEN IN CRAMPED SPACES!

WRITE TODAY FOR COMPLETE DETAILS AND NAME OF NEAREST DEALER...

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MIX and PAVE — ... ALL IN ONE OPERATION



THE BURCH
MODEL 12
PAVER and
RESURFACER
ONE MAN
CONTROL

Mixes, spreads, and levels bituminous material 10 to 12 feet wide in ONE pass. Material is rolled and mixed FOUR times. Easily adjusted to spread uniform thicknesses over varying contours. Wheel base is 22' 10". The Burch Paver is tractor-pulled — but its operation is hydraulically controlled, with power supplied by a self-contained gasoline engine.

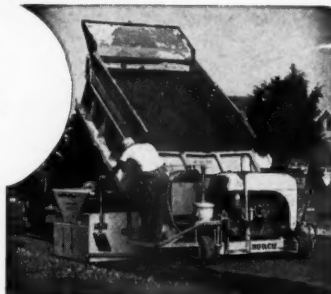
- For Bituminous Mix - In - Place
- For Gravel Roads
- For Soil Stabilization

BURCH ROAD WIDENER

(PATENTS PENDING)

- One-man control.
- For 2 ft. to 4 ft. standard widening.
- 4-speed conveyor belt.
- Will empty its hopper as fast as you can fill it.
- Equipped with BURCH exclusive truck coupler and special BURCH adjustable truck hitch.
- Applicable to any standard dump truck.
- No blocking of highways—right hand lane always open for traffic.

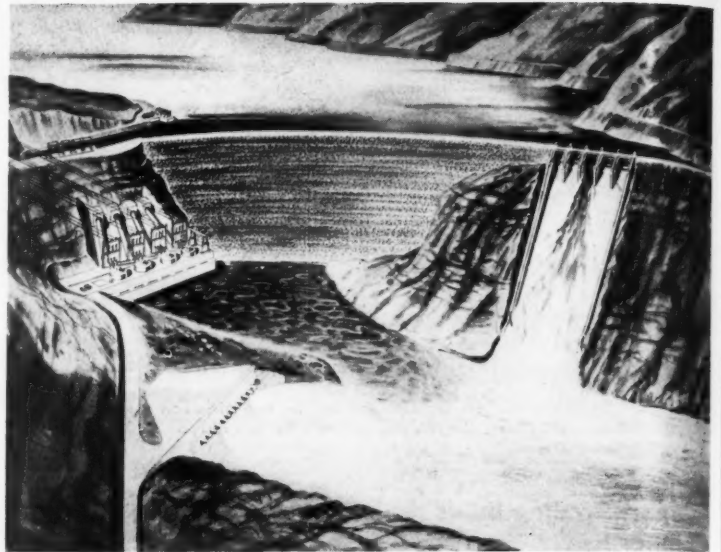
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The BURCH Road Widener is attachable to any truck. Built-in conveyor, which is driven by heavy industrial gas motor, will deliver material where required. It will handle sand, gravel, stone, or bituminous material. Self-propelled and steered by hydraulic equipment. A high speed unit unexcelled in road construction.

The BURCH Corporation
CRESTLINE, OHIO, U.S.A.
MANUFACTURERS OF EQUIPMENT
FOR CONSTRUCTION AND MAINTENANCE
OF ROADS AND STREETS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 315



Equipment ready to start

Preliminary work at the site of the Brownlee Dam project of the Idaho Power Co. in the Hell's Canyon stretch of Snake River is nearing completion, clearing the way for construction of the project's reservoir, powerhouse, spillway, intake and diversion channels, and a 600-foot bridge.

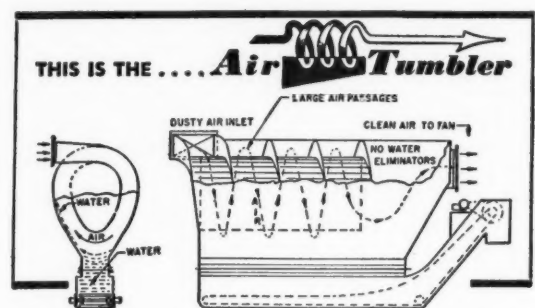
Although the major part of the work—construction of the powerhouse and the spillway and intake excavations—will not begin until after high water has subsided in the spring, Morrison-Knudsen Co., Inc., Boise, contractor for the Brownlee and Oxbow hydroelectric projects, started moving equipment into the site—about 140 miles northwest of Boise—early last November.

By the first week in December, a P&H 1055 shovel powered by a Caterpillar D364 engine had begun to face

up for the downstream portal of the diversion channel. The 3½-yard unit loads rear-dump haulage units, while one of five new Caterpillar D8 tractors handles cleanup work around the shovel. A Bucyrus-Erie 71B, powered by a Cat 318 engine, will excavate for the diversion channel. Horse-shoe shaped, the diversion tunnel will be 38 feet wide and 2,540 feet long.

Improvement of a primary access road on the Idaho side of the river and the construction of the base camp constitutes the work now in progress at the site.

Since Morrison-Knudsen has already established railheads at Cambridge, Idaho, and Robinette, Oreg., a first-class access road is now being built between Cambridge and the job site. This includes four miles of new road running from the existing road over the Idaho abutment, and down-



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SIMPLE — DEPENDABLE
NO FIRE HAZARD
HIGH EFFICIENCY
CONSTANT CAPACITY
LOW OPERATING COST

WRITE FOR BULLETIN NO. 531

DUST SUPPRESSION & ENGINEERING COMPANY

P. O. BOX 67

LAKE ORION, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 316



Working on the Oregon side of the river near Robinette, this P&H 1055 shovel powered by a Caterpillar D364 engine starts to face up for the downstream portal of the diversion channel. A new Cat D8 is on hand to do cleanup work around the shovel.

Construction of Brownlee Dam

stream to the dam. Several D8 tractors and a No. 12 motor grader are working on a 30-foot-wide 33-mile stretch of road with a 10 per cent grade.

On the Idaho side of the river, preparations have begun for a 200-man mess hall and dormitory facilities for 300 men. Camps for 200 trailers are being started in units of 50 on the Oregon side.

Excavation for the dam, including the powerhouse, totals 5 million yards. The Idaho intake channel, will be a 1,258,000-yard job, and the Oregon spillway will require a 1,630,000-yard excavation. The dam embankment itself will consist of 610,000 yards of fine sand filter material, 554,000 yards of clay fill, and a main rock fill of 5,059,300 yards, with the entire project requiring approximately 300,000 yards of concrete.

Estimated cost of the Brownlee project is \$63,000,000. Generating 360,000 kw of power, nearly twice Idaho Power's present capacity, the entire facility is scheduled for completion in November, 1958. By July of 1956, diversion of the river should be accomplished, and the dam is scheduled for completion in May, 1958. To allow for increased power needs in the future, provision is being made for adding two generators to the original four to increase power capacity by 50 per cent.

The Brownlee reservoir will contain 1,500,000 acre-feet of flood-control storage and will be 57 miles long. Its waters will back to a point near Weiser, Idaho. Spillway capacity meets the requirements of the U. S. Army Corps of Engineers, as will the minimum release requirement of 5,000 cfs for downstream navigation of the

Snake and Columbia rivers.

B. Williams, vice president in charge of dam construction, represents Morrison-Knudsen on the job. Field project manager in direct

charge of construction is Glenn C. Johnson. Idaho Power Co. is represented by construction chief E. A. Woodhead and project engineer F. R. McCormick. **THE END**

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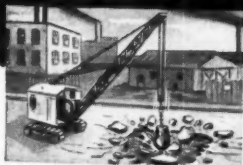
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Drilling and blasting

For the purposes of this discussion, rock is defined as any material which requires loosening by explosives in order to be dug economically by available machinery.

Surface excavation of rock is done chiefly for the following purposes:

1. Stripping—the removal and wasting of any type of rock or dirt in order to uncover valuable layers.

2. Cutting—removal primarily to lower the surface. In road and airport construction, the spoil is generally used for fill elsewhere on the project. In ditching, it is often used for backfill after installation of pipes.

3. Quarrying or mining—excavation of rock which has value in itself, either before or after processing. A rough distinction can be made be-

tween these two in that quarries are ordinarily concerned with the physical characteristics of the stone, and mines with its chemical composition. However, the terms will be used interchangeably here.

One excavation can involve all three classifications, as in a heavy road cut where some material is wasted, some is used for road fill, and

the best rock is crushed and used for aggregate.

Blasting may be divided into a primary operation in which rock is loosened from its original position in bulk, and secondary work which consists of reducing oversize fragments, and breaking back ridges and spurs. The latter is done in the same manner as other light blasting, such as breaking boulders and chipping out ledges.

Rock work may also be classified as to the type and fineness of breakage required. Quarrying of building or dimension stone involves loosening large solid pieces from the parent rock, while blasting for fill or crushed rock requires pieces small enough to fit in the shovel bucket, the fill layer, or the crusher.

Explosives

Commercial and military explosives are chemical compounds or mixtures, which can be decomposed quickly and violently. They may break up by a process of rapid burning (deflagration), or almost instantaneously (detonation). In either case, the original solid or liquid chemicals are largely changed into gases, which have a much greater volume. Heat is generated by the change, and serves to expand the gases still further.

There are a number of properties of explosives to be considered when selecting them for a job. These include sensitivity, strength, density, velocity, water resistance, fumes, perishability, price, and availability.

Sensitivity is a measure of the ease with which a substance can be caused to explode and its capacity to maintain explosion through the length of the borehole. This factor is also important in determining whether a particular explosive can be safely used.

Most commercial explosives are in an intermediate classification, being less sensitive than some of the compounds (such as nitroglycerin) from which they are made, but being less stable than military explosives.

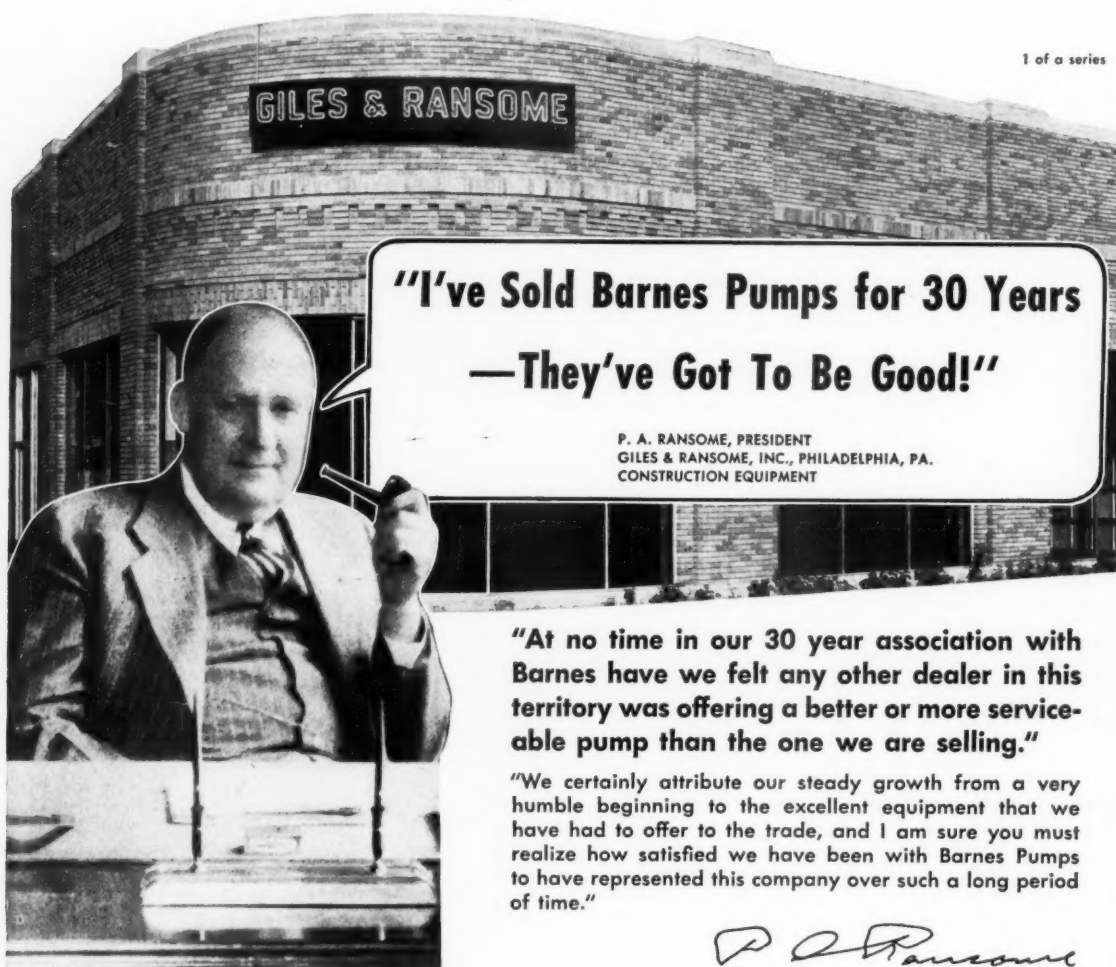
Strength is the energy content of an explosive in relation to its weight. Density is the volume of the explosive in proportion to its weight. Both these properties are chiefly used in classifying dynamite.

Velocity is a measure expressed in feet per second of the speed at which the burning or the detonation wave travels through an explosive. It varies from 1,000 to 3,000 feet per second for black powders to 23,000 feet per second for blasting gelatin.

Low velocity explosion has a heaving and separating effect, while high velocity crushes and shatters.

Water resistance is an important factor in wet rock, and varies not

This is the twelfth in a series of articles consisting of excerpts from the 1,280-page book, "Moving the Earth", by Herbert L. Nichols, Jr., published in March of last year. Priced at \$15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at \$15 plus postage.



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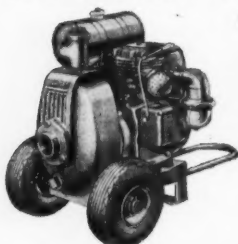
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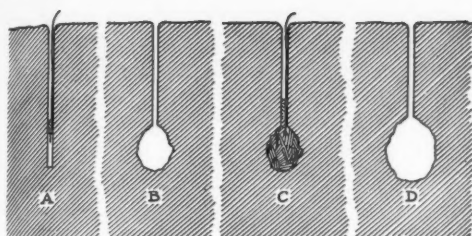
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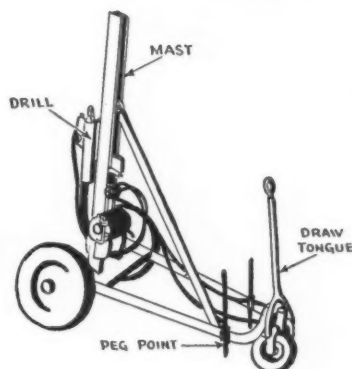
forward action in '56



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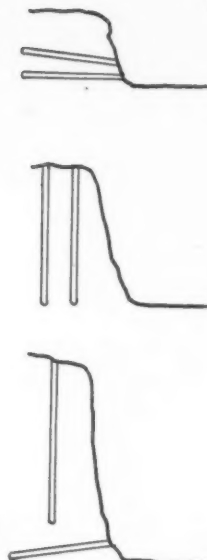


Springing a borehole



Wagon drill.

Horizontal and vertical drill holes.



only with the character of the explosive, but also in the manner in which it is packed and wrapped. Manufacturers are increasingly able to put water resistance in the explosive rather than in the wrapper.

The gases resulting from explosions vary in toxic and irritating qualities. This is very important in underground work, particularly if ventilation is poor. Explosives are rated by the manufacturers according to fumes, as excellent, good, fair, and poor.

Explosives vary widely in the length of time they can be kept under various conditions before deterioration makes them dangerous or useless. Dynamite was formerly damaged by freezing, but this difficulty has been entirely overcome. Spoiling may be a serious factor if use is subject to delay, particularly in hot wet weather.

Different dynamites vary widely in price, and the most economical type for a certain use is often in the higher brackets. In other words, a dynamite should be selected on the basis of final results, rather than first cost.

In many areas, very few types of explosive may be available, and because of the complications of shipping, delivery of special orders may be delayed weeks or months. Under such conditions, use of the standard dynamite may be advisable even if it is not exactly suited to the job.

If special explosives are purchased from a contractor or a quarry, it may be necessary to handle the transaction through a dealer in explosives to comply with state laws.

Permissible dynamites are those approved by the U. S. Bureau of Mines for use in gassy and dusty coal mines. Their most important feature is minimum flame in the explosion.

Drilling

The simplest type of drilling pattern is a straight line of vertical holes parallel to a vertical face. The distance from each hole to the face is called its burden, and the distance between holes their spacing.

The holes are drilled somewhat deeper than the face so that any ridges left between them will not project above the new grade.

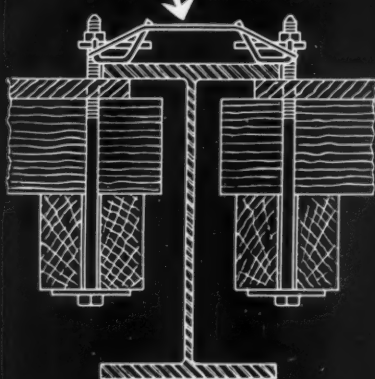
Blasts tend to overbreak at the top and not shatter completely at the base. As a result, faces tend to slope back. The projection of the bottom beyond the line of the top is called the toe.

The extra burden at the toe may be handled by bottom drilling, or heavier loading (more powerful explosive or tighter packing) in the bottoms of vertical holes.

A face may be a few feet or several

(Continued on next page)

Faster Adjustment from TOP of Deck



TOTAL SAFE LOAD ON BOTH COIL BOLTS IS 10,000 LBS., OR 5,000 LBS. PER BOLT

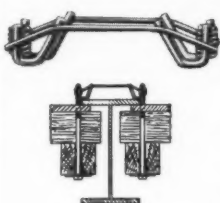
WHEN HANGING FORMS WITH SUPERIOR PLATE HANGER FRAMES



With Superior Plate Hanger Frames the installation and necessary adjustment to bring the deck forms tight against the flange are from above the deck. Coil Bolts are passed through and secured from above with coil nuts. Bolts are easily removed without binding because, (1) nuts are square and will not turn; (2) embedment of the bolts in the concrete is at a minimum since the plate is only $\frac{1}{2}$ " above the flange.

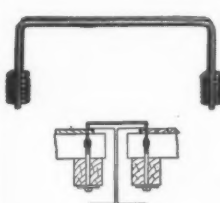
FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

STANDARD COIL HANGER FRAME



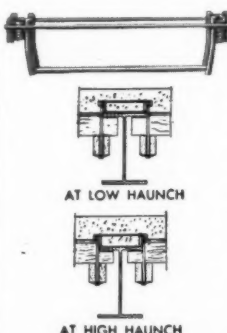
When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior Standard Hanger Frames. Detail at left shows their use with double ledgers, $\frac{1}{2}$ " coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

COIL BEAM SADDLE



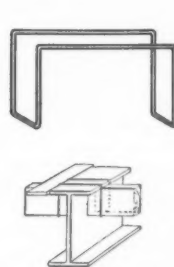
On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each $\frac{1}{2}$ " Coil Bolt. Coil Beam Saddles are also furnished for $\frac{3}{4}$ " and 1" bolts.

SPECIAL HANGER FRAME



The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch of varying depth on the upper flange. Superior Special Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the $\frac{1}{2}$ " coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail). Total safe load per frame is 10,000 lbs., or 5,000 lbs. per $\frac{1}{2}$ " bolt.

WIRE BEAM SADDLE



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

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(Continued from preceding page)

hundred feet high. High faces are usually developed by pushing low or moderate ones back into a hillside. Where the height can be regulated, it is more efficient to make a deep rock cut in a series of benches, or lifts. These lifts are likely to be from 10 to 50 feet in mines or quarries, and 10 to 20 in road cuts.

Height affects the method of drilling and the size and placement of the holes.

In general, hand drills are used for depths up to 10 feet, wagon drills from 10 to 30 feet, and churn drills for higher ones. However, the lighter drills are often used to greater depths, particularly when access is difficult. The overlap zone of wagon and churn

or rotary drills is in between 30 and 80 feet.

Hand drills will produce hole diameters of between 1 and 2 inches, wagon drills 1½ to 4½ inches, and well drills 4 inches and more. Hand and wagon drills with steel bits will produce holes tapering from the top to the bottom, and fairly uniform diameters with carbide bits. Well-drill holes should not taper.

The explosive in each hole is supposed to break out a section of the rock between the line of holes and the face. Only experience with the particular rock and explosive will indicate exactly the amount and type required.

In a general way, however, it may be said that a pound of 40 per cent dynamite should break up and move two yards of soft rock, or one yard of medium hard rock, on an open face. In soft, layered, or rubbery rocks, 20 per cent dynamite might move more per pound; while in very hard rocks, even higher strength dynamites might have smaller production. In tight holes, at edges, and in corners heavier loading is required.

Loading

Holes may be loaded in a number of ways. These may be classified as solid, string, spaced, deck, and spring.

In solid loading, as much explosive is crammed into the hole as it will take. Usually, cartridges slightly smaller than the hole are slit and dropped or pushed into the hole, and then crushed with a tamping stick so that they will spread.

String loading is used if the borehole is wet enough so that slit or unwrapped dynamite would be spoiled, or if solid loading would make too heavy a charge. Cartridges somewhat smaller than the borehole, but not small enough to fit side by side, are dropped in one after the other without tamping, or after the bottom cartridge or two have been tamped.

This, the easiest way to load, is satisfactory for small or occasional blasts. However, it is inefficient if that part of the hole is wasted, so that more rock must be drilled than is actually necessary to accommodate the amount of powder required for the blast.

Spacers may be used to string cartridges out along a hole that is not to be fully loaded. These may be square, round, or hollow pieces of wood, tile, lean concrete, or rolled carboard. They are usually made up ahead of time, in lengths of 8 to 10 inches. There should be sufficient air space around them to enable the cartridges to set each other off by propagation.

Spacers may be alternated with cartridges or pairs of cartridges in the parts of the borehole that are not to be fully loaded. The primer cartridge should have at least one additional stick in contact with it.

In large boreholes, charges which are to be strung out are usually separated by solid plugs of sand or other stemming material (decking), and each section of the charge primed separately, unless fired with Primacord or other detonating fuse.

GASOLINE BARCO RAMMER



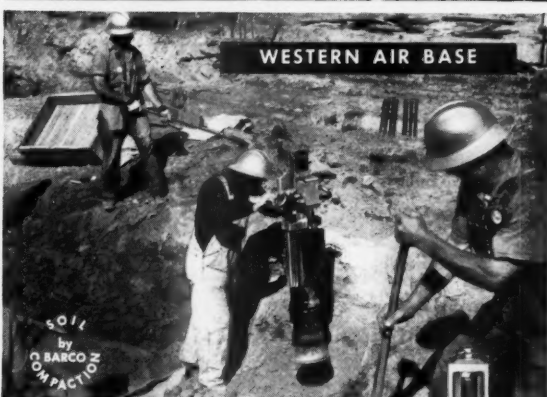
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Easily meets rigid specifications—

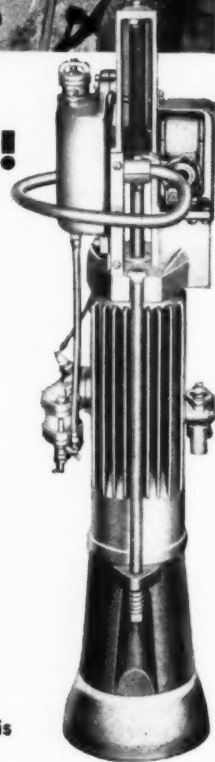
In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful for compacting fill in

restricted areas—close to walls, culverts, abutments, around footings, and in trenches. ONLY the Barco Rammer can produce specified high degree compaction on lifts up to 20 inches.

Gets jobs finished on time—

One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

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If the force of a blast is to be concentrated at the bottom or back of a hole, it may be necessary to make an enlarged chamber to hold extra explosive (springing). This is done by exploding a small quantity of dynamite—one to six cartridges for a 2-inch hole—in the bottom. The hole may be left open, or lightly stemmed with dry sand, or with water. Quick acting dynamite is used. The charge must not be large enough to blow out the face.

Priming

A primer is a stick of dynamite that contains a blasting cap, or is any other heavy explosive which has been fitted with a device for setting it off.

Since primers combine the power of the dynamite with most of the sensitivity of the cap, they must be handled with greater care than any other units of explosives.

They are ordinarily prepared at the borehole immediately before being placed, but may be made in some central place and delivered to the loaders as required.

The essentials of a good primer are: the cap must be powerful enough to produce detonation; there must be intimate contact between cap and explosive; they must be fastened together so that they will not separate while being placed; the cap should be shielded from shock or friction; and the wires or fuse should not be kinked or strained.

Damage

One of the contractor's problems in connection with blasting is the possibility of real or imaginary damage being done to structures in the vicinity.

An explosive, if properly used, will expend most of its energy in shattering the rock immediately around it. The remaining energy will set up waves or vibrations in the ground, and sound and concussion in the air.

The noise of an explosion may cause most or all of the neighborhood difficulties. Mudcaps, shallow blasts, overloaded holes, fractured rock, and other conditions that allow the explosion to break out into open air before expending its energies, are productive of complaints all out of proportion to the amount of explosive used.

Boulders and oversize blast fragments should be drilled before blasting. The noise is tremendously reduced, and it will usually be found that the saving on explosive and the better fragmentation obtained will more than outweigh the cost of the drilling. When there are only a few pieces, the nuisance of clearing the pit for blasting may be avoided by plug-and-feather splitting. In brittle rock, a crane with a skull-cracker steel ball may be the most economical solution.

Throw can be closely controlled by working downward, using small blasts and covering them with mats or chained logs. If the cover is large and heavy in proportion of the strength of the explosion, it will prevent any scattering of fragments. If the charge is heavy enough to lift

the cover, it will move somewhat less than the average distance of throw to be expected from an uncovered blast, and fragments with higher than usual velocity will be held in.

It is important that the cover extend several feet beyond the area being shot, particularly if the charge is heavy enough to lift the mat, as fragments might escape under its edges.

(To be continued next month)

Oliver elects executive

Edward H. Fisher has been elected a vice president of The Oliver Corp., Chicago, Ill., manufacturer of industrial equipment. He is the head of the industrial sales division of the firm.

High-lift platform is tractor-mounted

■ A tractor-mounted work platform which can serve as a portable scaffold reaching up to 18 feet high has been announced by American Road Equipment Co. The unit may be used to lift materials and workers.

The 3×4-foot platform is an attachment for the company's Economobile 600 heavy-duty hydraulic loader. The platform has a plank floor laid on a heavy angle-iron frame, and 3-foot-high tubular-steel safety rails. The front rail can be removed.

Equipped with a 4-foot auxiliary hydraulic tower, the Economobile can hoist materials up to 22 feet. The unit has a reach up to 6 feet.

For further information write to



Equipped with a new platform, the Economobile 600 lifts a man 18 feet.

the American Road Equipment Co., 4302 N. 28th St., Omaha, Nebr., or use the Request Card at page 18. Circle No. 132.

JOY TWM-5 CHALLENGER DRILL

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80° DRILLING RANGE

The Joy TWM-5 Challenger will drill at any angle between vertical and 10° above horizontal, making it applicable to almost any range of drilling required.

EXTREME MOBILITY

The TWM-5 is self-propelled on either rubber tires or crawler treads. It is driven on each side by a reversible piston type air motor, can turn in its own length, and can move into and out of most "tight" spots.

REMOTE CONTROL

All functions of operation, both drilling and moving, are controlled from the operator's station on the frame, directly over the left front wheel. Three hydraulic jacks provide stability while drilling.

TM-500 DRILL

The drilling machine on the TWM-5 is the JOY TM-500, a 5¼" piston drill, which has proved itself in quarry, construction, and mining work as the first and still the leader in the big drill field. The TM-500 is mounted on an extra sturdy mast which is raised and lowered hydraulically.

ADDITIONAL FEATURES

Optional features available on the TWM-5 are a cab, designed for the best in operator comfort and protection, and a dust collection system.

Check today on the Joy TWM-5 for your drilling operation. Whether you drill vertical holes or toe holes, it will fit your program and give added rock tonnages from the day it first goes to work. Write for complete information today to Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

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Joy TWM-5 drilling deep holes (50' to 100') in granite in a southeastern quarry.

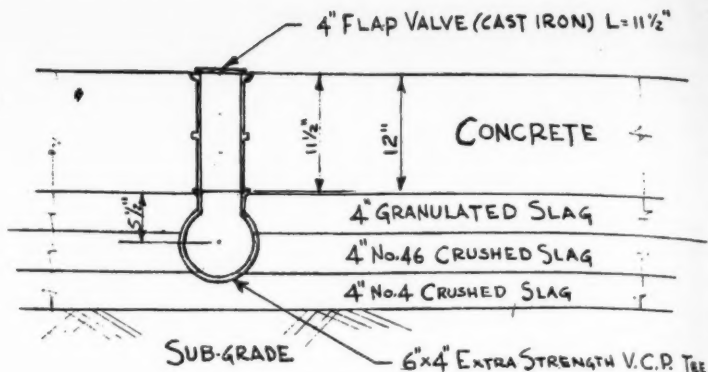
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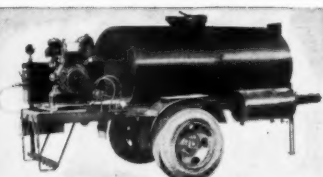
Flap-valve Construction



Subsurface water passes through slag, perforated pipe, flap valves; piling is not needed to eliminate "floating" effect on empty tanks



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Front or rear mounted for truck or trailer
... with pressure metering.



MAINTENANCE UNIT
Heating and spraying unit ... 2-wheel
or truck mounted.



SUPPLY TANK
Truck or semi-trailer mounted ...
single or tandem axle.



ROSCO-PACTOR
9 or 13 wheel roller ...
90 to 125 cubic feet capacity.



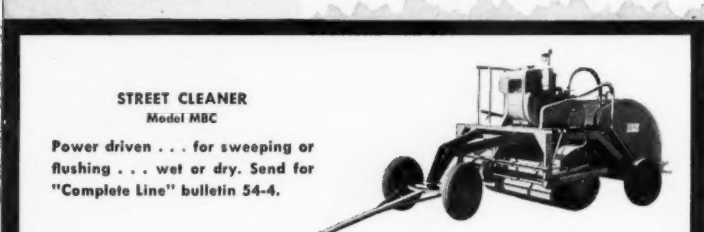
ASPHALT KETTLE
2-wheel pneumatic mounted ...
hand or power spray.



ROAD SWEEPER
Two way ... power driven ...
full 4-wheel trailer mounted.



STREET FLUSHER
Truck mounted as shown
or 2-wheel model for towing.



STREET CLEANER
Model MBC
Power driven ... for sweeping or
flushing ... wet or dry. Send for
"Complete Line" bulletin 54-4.

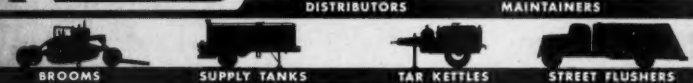
a partial showing of the complete **ROSCO LINE**

of construction
and maintenance
equipment for

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- STREETS
- AIRPORTS

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"Complete Line" bulletin 54-4.

Rosco
MINNEAPOLIS



3118 Snelling Avenue

Minneapolis 6, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 325

A unique feature that is saving money on the job—and will save money in repair bills later on—is being incorporated in the secondary sewage-treatment plant being built for Akron, Ohio, in an area having a high water table and requiring constant dewatering.

Basically, the contract calls for the erection of five aeration tanks, 300 x 300 feet, on one concrete mat, plus ten 100-foot-diameter final settling or sludge tanks.

Normally, under such wet conditions, it would be necessary to drive foundation piles and embed them in the concrete mat under the tanks. This would require expensive pile-driving equipment, piles, and a concrete mat about 2 feet thick to cap the piles and form the tank floor.

All this would be necessary to offset any possible "floating" effect by the empty tanks. This effect, due to hydrostatic pressure, would be counteracted by the piles, which would literally hold the tanks down. When the tanks are full of sewage, this danger does not exist. But when they are empty, the ground water would actu-

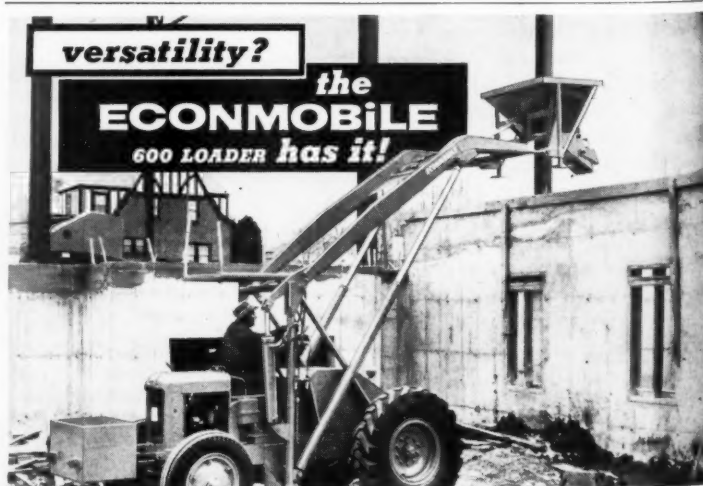
ally "float" the tanks, and this would result in expensive repair bills.

On this job, the contractor did away with the need for this work by constructing the secondary plant so that subsurface water can pass through the 12-inch crushed slag base under the concrete mat, then to perforated pipe leading to an empty tank.

Remove unsuitable material

This \$3,900,816 facility, being constructed for the city of Akron by Hunkin-Conkey Construction Co., Cleveland, Ohio, will increase the capacity of the existing plant to 50 million gallons per day when it is completed in December. At present, a trickling filter system is being used, but this will not be able to serve Akron at its present rate of growth.

The first job to be done by the contractor when he moved in last July was the removal of 250,000 cubic yards of silt from an area measuring 1,000 x 1,600 feet. Two 2 1/2-yard draglines, a Northwest and a Lorain, and a fleet of eight Euclid 15-yard bottom-dumps handled this work; the Euclids depositing the material in a lagoon about a



The ECONMOBILE has seven different attachments: Pallet fork; auxiliary tower; concrete hopper; aggregate and general purpose bucket; dozer blade; work platform; and chain boom. And each attachment makes the ECONMOBILE a different piece of machinery.

The ECONMOBILE has a hoisting height of up to 22 feet; a reach of up to 6 feet; and a clearance of 8 feet.

Why not get complete details on this versatile machine that has saved many contractors as much as \$368 per day on labor costs.

write, wire
or call

manufacturer of famous American Road Grader
AMERICAN ROAD EQUIPMENT COMPANY
4310 North 28th Street Omaha, Nebraska
Phone PLeasant 2575

For more facts, use Reader-Reply Card opposite page 18 and circle No. 326

CONTRACTORS AND ENGINEERS

quarter of a mile away. A Caterpillar D8 tractor was spotted around each dragline to maintain haul roads and assist the vehicles through the wet muck. The largest cuts on this work came to about 14 feet.

Drainage ditches

Because of the wet and clayey condition of the soil and the size of the excavation, the contractor decided to use a system of drainage ditches instead of a wellpoint system to get rid of water. Parallel ditches with inclined slope bottoms were dug in the subgrade, and these allowed rain and ground water to flow into a feeder ditch, which in turn, fed a sump. This sump, 20 feet square and 40 feet deep, was built with interlocking sheet piling, driven by a McKiernan-Terry No. 7 and No. 9 hammer mounted on a Lorain 80 crane.

After the 40-foot sections had been driven, the hammer was removed and a clamshell bucket substituted on the Lorain. This new combination excavated material within the sheeting to form the 40-foot sump. Bracing, consisting of 12-inch 60-pound H-beams, was welded on the inside of the sheeting in three horizontal bands that were placed on 10-foot centers. Cross-bracing was then placed for each band.

Water was removed from the sump by a Deming 10-inch electric well pump that had an automatic floating device to cut the pump in and out. This pump had a capacity of 2,200 gpm—more than enough to maintain a low level of water in the sump. Water passed through an 8-inch pipeline and discharged in a nearby stream. A Jaeger 6-inch gasoline-driven pump was used as a standby in case electrical failure put the Deming pump out of operation.

Special base

With the drainage problem solved, Hunkin-Conkey was free to haul in

the different sizes of aggregate that made up the special base for the aeration and final settling tanks.

After the subgrade had been compacted with a Tampo Model SP 9 self-propelled oscillating-wheel roller and a Buffalo-Springfield 5-ton three-wheel roller, the first of three courses was put down. This, consisting of a 4-inch-thick layer of No. 4 crushed slag—with particles varying from 1 to 1/4-inch—was deposited by truck and spread by a Caterpillar No. 21 grader. Compaction of this course was handled by the Tampo and Buffalo-Springfield rollers.

The crushed slag used in the 12-inch base course, obtained from U. S. Steel Corp.'s plants at Youngstown and Lordstown, Ohio, was transported to the site in 18-ton trucks. This type of base-course construction was necessary, because the wet subgrade required excellent drainage and because of the new design feature incorporated.

This feature was the perforated, extra-strength, 6-inch-diameter vitrified-clay pipe, which was placed on the first course of No. 4 slag. Pipes were placed on 32-foot centers for the aeration tank on 30 degree radii for the circular settling tanks. A 6x4-inch extra-strength, vitrified-clay pipe-tee was then placed every 32 feet in the perforated pipeline for each type of tank. When the tees were in place, the contractor placed the other two 4-inch courses to complete the base. The second layer was a course of No. 46 crushed slag, compacted to 4 inches, having particle sizes from 3/4 to 1/4-inch. The final course, also having a compacted thickness of 4 inches, consisted of granulated slag.

Before concrete was poured for the reinforced-concrete tank mat, cast-iron flap-valves, 11 1/2 inches long and 4 inches in diameter, were installed in every tee. The valve flaps are flush

(Concluded on next page)

OVERMAN STONE AND BITUMINOUS SPREADER



THEY USE 'EM EVERYWHERE

... IN THE HEART OF TEXAS—where big people do things in a big way, the Overman Spreader proves its ability to uphold the Texas tradition—it does its work in a big way. While it is a small, compact machine, you will find it equal to the job, no matter how large. Yet it can easily be towed between jobs, and maneuvered into place on small driveways and parking lots.

For speed, economy, performance—you just can't beat it.

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TODAY

I. J. Overman Mfg. Co.
BOX 896 MARION, IND.

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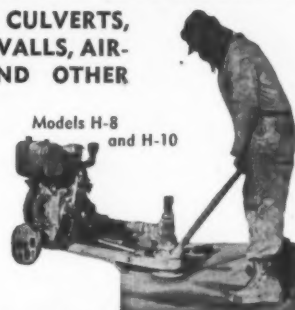
MARCH, 1956

"BERG" CONCRETE SURFACERS

FOR BRIDGES, DAMS, CULVERTS, HIGHWAYS, FLOORS, WALLS, AIRPORT RUNWAYS, AND OTHER APPLICATIONS



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Model A



Models H-8
and H-10

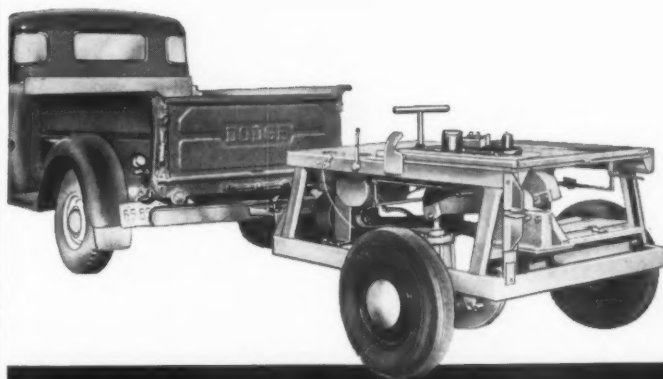
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MODEL A. Lightweight, electric powered unit . . . suspends from operator's shoulder. Interchangeable heads and attachments for surfacing concrete buildings, bridges, dams, walls, culverts, etc. MODELS H-8 and H-10. One-man gasoline engine powered units for surfacing concrete highways, streets, floors, airport runways. Includes exclusive power take-off for attaching "BERG" flexible shaft equipment for surfacing bridges, walls, etc. Write today for descriptive literature on machines and attachments.

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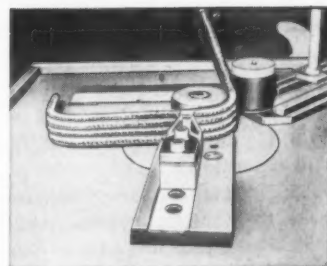
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JOB CONTROL with the IRONMASTER

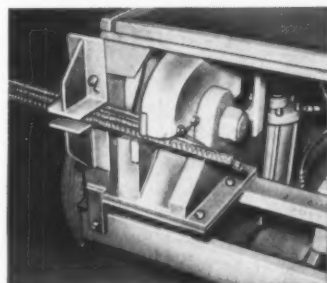
PORTABLE HYDRAULIC BENDER AND SHEAR

SCHEDULES MET — The IRONMASTER eliminates waiting for pre-fabricated bar deliveries and delays caused by changes or errors in specifications. The IRONMASTER combines precision power bending and shearing of all sizes of reinforcing bars in a single, compact and fully portable unit. Complete, fast and accurate on-the-job fabrication gives you better control of the pace of your job, and keeps the job on schedule.



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ACCURACY MAINTAINED — The IRONMASTER'S accurate and automatic angle-of-bend adjustment assures precision fabrication of all your re-bar requirements.



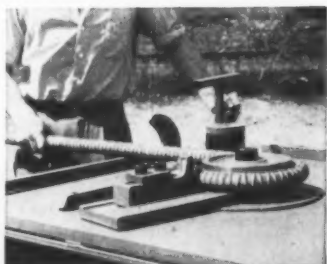
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COSTS LOWERED — The IRONMASTER reduces re-bar handling time and expense, and eliminates long hours of back-breaking hand bending. It is low in original cost, and job-proven to be low in maintenance cost.

- available with gasoline or electric power in portable or stationary models.

- write for free bulletin No. B-56

IRONMASTER
MIDLAND PRODUCTS COMPANY
MIDLAND PARK, N. J., U.S.A.



HOOK BENDING NO. 11 BAR

For more facts, use Reader-Reply Card opposite page 18 and circle No. 329

(Continued from preceding page)

with the surface of the concrete slab, which was poured only to a 12-inch thickness since foundation piles were not used. If they had been used, the slab would have been placed to a 2-foot thickness.

Concrete placed for the mats was consolidated with a gasoline-driven Mall 5-hp vibrator. Reinforcing consisted of 3/4-inch rounds on top and 5/8-inch steel on the bottom. The concrete, having a slump of 2 to 3 inches, was supplied by Botzum Bros. Co., Akron, Ohio. It was brought from a nearby batch plant in Rex 6-yard transit mixers and placed by a Lorain crane with a 1-yard bucket.

The construction of the base and mat will allow subsurface water to pass through the 12-inch crushed slag base, into the perforated pipe, up through the vertical flap-valves under hydrostatic pressure, then into the empty tank. This eliminated the possibility that an empty tank will "float", since there will be a flow and release of water under the pressure that develops. When the tanks are full, the fluid weight will keep the valve flaps closed and prevent any "floating" effect. Construction of the concrete mats, base course, and the flap-valves was similar for both types of tanks.

Concrete for tanks

The five aeration tanks are being built on the 300 x 1,600-foot concrete mat. Exterior and interior wye walls are being formed by 100-foot-long sections of Universal steel forms having plywood backing. Concrete is poured through chutes into the forms by a Lorain 80 crane with a 1-yard concrete bucket.

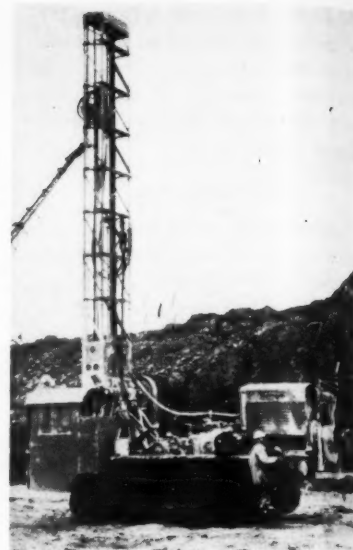
Walls for the aeration tanks are about 17 feet high and 15 inches thick. An expansion joint, running the full height of the wall, is being placed every 100 feet between pours. This joint, consisting of a hard-rubber seal embedded into adjacent sections, will make the joints completely waterproof. The 1/2 to 1-inch voids on either side of the rubber seal are being filled with two premolded neoprene-rubber strips. When completed, the walls will be 3 feet above ground level and will require about 50,000 cubic yards of backfill.

The 12-foot-high walls of the circular settling tanks have no expansion joints. Concrete is being placed by a bucket and crane. The 12-inch-thick walls, constructed with Universal forms, are tied to the concrete mat by means of dowels and reinforcing steel. Concrete for both aeration and settling tanks is being poured in a single lift. After 24 hours, forms are stripped and moved to a new section of the wall. Then the newly placed concrete is water cured for about 7 days.

G. W. Gump is the superintendent for Hunkin-Conkey on this project, which will require about 32,000 cubic yards of concrete before it is completed this year. During the peak of operations, the firm employed about 200 men on the plant, which was designed by Beiswenger & Hoch of Akron.

THE END

A NEW ROTARY DRILL specifically designed and engineered for quarry blast-hole drilling is announced by Reich Bros. Mfg. Co., Inc. Using hydraulic power throughout, the new machine is capable of 20,000 pounds down pressure on the bit. Holes up to 6 1/4 inches in diameter may be drilled in hardest rock, according to the manufacturer. Cuttings are removed by air circulation. For further information write to Reich Bros. Mfg. Co., Inc., Terre Haute, Ind., or use the Request Card at page 18. Circle No. 113.



ONE MAN PLACES CONCRETE BETTER, FASTER

with

NEW Homelite Concrete Vibrator Set (HIGH-CYCLE ELECTRIC)



One simple connection and you're ready to pour with the new Homelite Concrete Vibrator Set. It reduces hand labor, eliminates scaffolding and speeds placement of even the lowest slump concrete.

The high-cycle motor built into the vibrator head makes the Homelite extremely powerful and easy to use. The vibrator head has one-foot handling hose, with polarized, screw-type waterproof connection permanently installed. Any number of 7' or 10' lengths of pre-loaded polarized handling hose can be attached in seconds.

The high-cycle motor is protected against overheating — even if it runs out of the concrete — and the hi-cycle design eliminates brushes and commutator.

The generator will run two vibrators simultaneously, doubling the placement speed. Heavy-duty cable, available in varying lengths, lets you place the generator in any convenient spot. Only the vibrator is in contact with the concrete and no special scaffolding or cradling is ever needed.

Ask your nearest Homelite office for a free demonstration, or write for Bulletin L-816.

Homelite vibrator runs at 10,000 vpm, best speed for vibrating concrete. Motor holds speed constant, even under full load. Speed never fades.

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A DIVISION OF TEXTRON AMERICAN, INC.

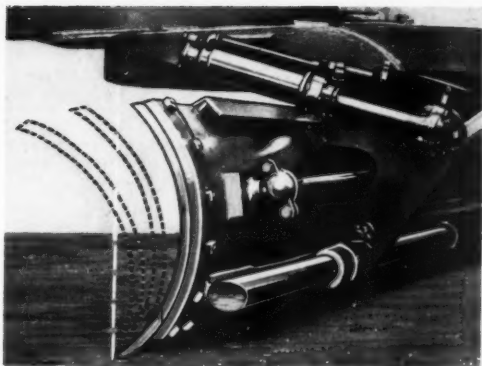
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PORT CHESTER, N. Y., U. S. A.

Manufacturers of Carryable Pumps, Generators, and Chain Saws

For more facts, use Reader-Reply Card opposite page 18 and circle No. 330

CONTRACTORS AND ENGINEERS

A control lever in the grader cab adjusts the pitch of the Hydra-Tilt moldboard.



Hydraulic moldboard tilt speeds grader-blade work

■ The Hydra-Tilt moldboard, a new Gallon Iron Works development, permits the grader operator to adjust the tilt of the moldboard without

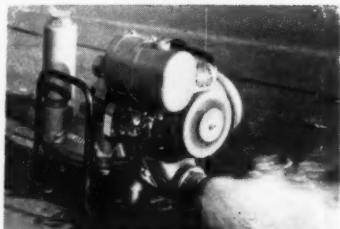
leaving the cab or stopping the grader. A touch of a hydraulic control lever on the operator's platform instantly sets the moldboard pitch at any point between minimum and maximum. The moldboard will then be held firmly until changed, without creeping.

The attachment is reported to work well with regular or hydraulically shiftable moldboards. The company supplies two hydraulic cylinders, one for each side of the circle.

The Hydra-Tilt moldboard is said to be suited for road maintenance, ditching, sloping, finishing, and snow and ice removal.

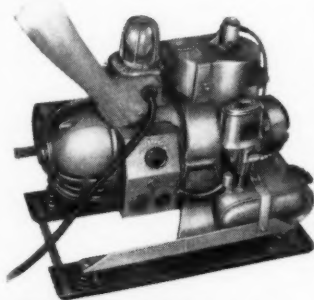
For further information write to The Gallon Iron Works & Mfg. Co., Gallon, Ohio, or use the Request Card at page 18. Circle No. 30.

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Carryable
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Equipment



SELF-PRIMING CENTRIFUGAL AND DIAPHRAGM PUMPS

Sizes: 1½" to 3" — capacities to 15,000 g.p.h. for dewatering and water supply.



ELECTRIC GENERATOR SETS FOR TOOLS AND LIGHTS

Complete range of sizes and voltages up to 5,000 watts.



LIGHTWEIGHT POWERFUL ONE-MAN CHAIN SAWS

Complete line of saws with clearing and brushcutter attachments for every woodcutting job.

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PORT CHESTER, N. Y.

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MARCH, 1956

Roller, paver, and widener

■ Three pieces of Blaw-Knox heavy roadbuilding equipment—a road widener, trench roller, and base paver—are illustrated in a new catalog from the manufacturer. These machines are now part of the company's Complete Package line.

This line includes the MultiFoote concrete paver, paving forms, a sub-grader, a concrete spreader with vibrator, a concrete finishing machine, an aggregate-batching plant, and a cement-batching plant. These are all shown in a composite sketch of a roadbuilding operation.

Discussed briefly, too, are the Blaw-Knox bituminous paver and the new Adnun Junior Black-Top paver.

The catalog is available in English,

French, Spanish, and Portuguese editions.

To obtain Catalog No. 2502 write to Blaw-Knox Co., P. O. Box 1198, Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 49.

Mason's jacks

■ A mailing piece from Beaver Advance Corp. details Advance mason's jacks for concrete block, brick veneer, and concrete form work. Made of tubular steel, these jacks are adjustable every 2 inches from 4 to 7 feet. Three platform widths permit 3-high tier to 21 feet.

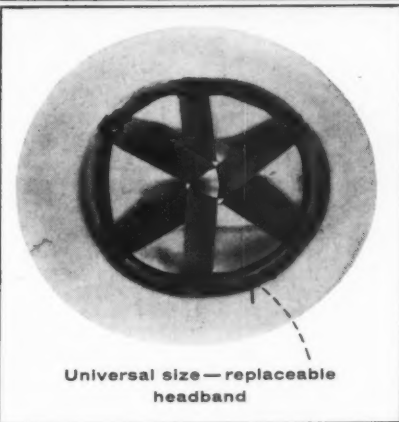
To obtain this mailing piece write to Beaver Advance Corp., Box 792 Ellwood City, Pa., or use the Request Card at page 18. Circle No. 6.

PROVEN BY THE REBOUND!



These Bullard engineering and sales research men are studying not only the impact, but also the rebound of this eight pound ball. Rebound action is the extra safety margin in Bullard safety hats and caps. Their scientifically designed three-ribbed crown not only resists impact but deflects heavy falling objects. This is one of the reasons why Bullard fiber glass hats and caps surpass all necessary industrial tests.

Greater protection plus style, comfort and color make Bullard head protection the best and longest lasting buy in safety hats and caps. Chin straps, winterliners and face shields are available for all styles of Bullard safety hats and caps.



Universal size—replaceable headband



Three-ribbed crown construction



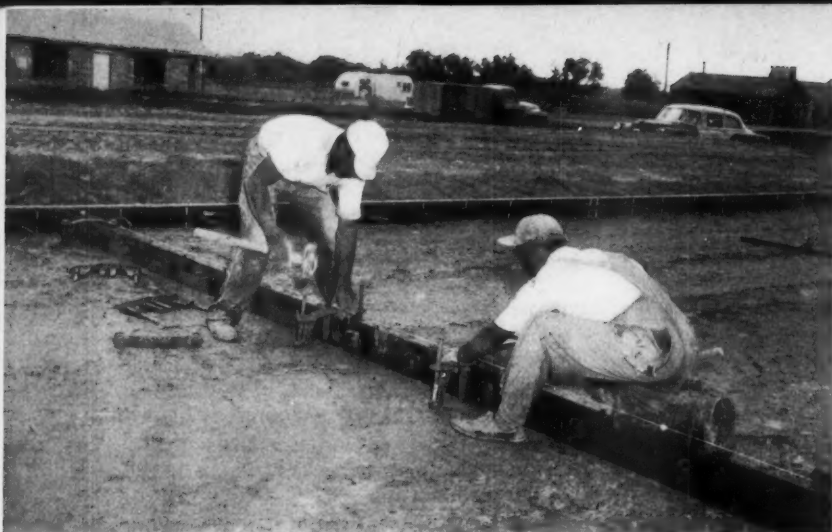
Choice of permanent molded-in colors to identify company or trade. Aluminum hats and caps available also in variety of colors.

BULLARD

E. D. Bullard Company, 275 Eighth St., San Francisco

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Workmen complete the setup for an expansion joint, formed by a redwood strip shaped to the crown of the roadway and fitted with Star lug load-transfer assemblies. Clamps holding the assembly will be removed when concrete has been placed.

C&E Staff Photos

Clamps on the outside forms hold reinforcing rods in place while concrete is spread. When the clamps are removed, the rods are left in the proper position. The paver pulls the Ford F-600 water truck by a cable, minimizing the danger of damage to the water hose.



Special-duty rigs augment base, concrete paving spreads

Concrete pavement joints are formed with special assemblies; sandstone base is compacted by shopmade, tractor-drawn roller

Expansion joints and transverse contraction joints, formed with redwood strips fitted with Star lug load-transfer assemblies, were only part of the specialized equipment used during paving work on U. S. 66 at Claremore, Okla.

The wood strips for the expansion joints extended completely through the slab, while the contraction joints had only a narrow wood strip at the bottom. Both these transverse and longitudinal joints were sawed to a depth of 1½ inches after concrete was placed.

This work, combined with a special 15-ton roller for crushing and com-

MAN-SIZE 36" Kolman 'a Brute for Production!'



50' x 36" KOLMAN Portable Conveyor-Screen Plant with built-in feeder and wing walls on a Peter Kiewit Sons' Co. job in Montana.

KOLMAN
COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR • SCREEN • TRAP • FEEDER

Loads Out 15-Ton Trucks In Less Than a Minute!

Here's the conveyor-screen plant that really puts it out! Contractors throughout the country are finding that the KOLMAN Model 101 comes through with top production under the severest operating conditions.

Shown above is the 50' x 36" KOLMAN plant owned by Peter Kiewit Sons' Co. It's capable of loading out these 15-ton trucks with highway base course material in less than a minute. No wonder they say it's a "brute for production!"

It carries a vibrating screen 8' x 48" without additional support, and the screen need not be removed for transportation—it just folds under out of the way.

LOOK AT THESE FEATURES

Self-cleaning tail pulley, bar type self-lagged head pulley, all anti-friction bearings, choice of greaseless or regular ball-bearing idlers,

pneumatic tires, separate clutch for individual operation of vibrating screen and conveyor belt, motor-to-ground controls, hydraulic hoist with "V" type carriage trucks for low road clearance, and self-cleaning steel belt cover.

The steel dozer trap with built-in plate feeder, available as optional equipment is an integral part of the conveyor and also fully portable. Model 101 KOLMAN Portable Belt Conveyor is available in 18 to 36 inch belt widths and in lengths as desired.

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Send literature on:

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MEN OF STEEL



The reconstruction of the swing-span over the Harlem River between the boroughs of Manhattan and the Bronx was executed by TERRY.

The story behind the brilliant construction achievements of the great TERRY organization is basically the story of men. Men of proven ability. Men of vast experience. Above all, dedicated men who have made it their business to master every facet of engineering, designing, fabricating and erecting. In every sense of the word, men of steel.

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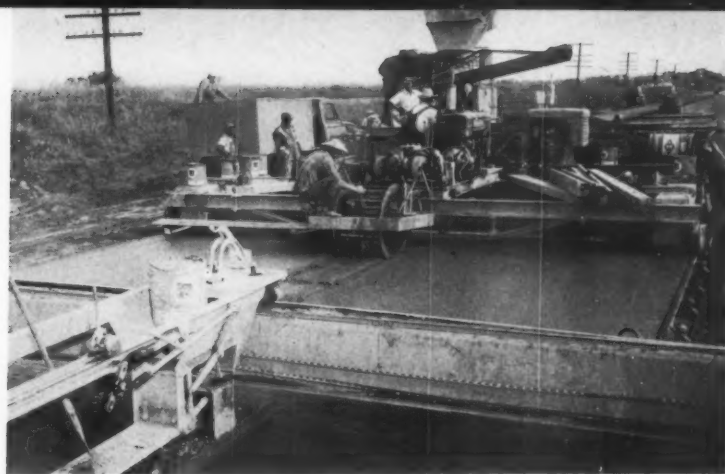
31 East 27th Street, New York 16, N. Y. • MURRAY HILL 9-0011

For more facts, use Reader-Reply Card opposite page 18 and circle No. 334

CONTRACTORS AND ENGINEERS



Concrete placed by the Koehring 34-E Twinbatch paver is spread by a Blaw-Knox blade-type spreader. The vibrating tamper bar at the rear is driven by the engine of the spreader.



A wheel-type attachment on the rear of the Blaw-Knox finisher sets center tie bars to proper depth and at 30 inch centers in the slab. This shop-made attachment was originated by another paving contractor.

packing sandstone base material, a high-speed tractor-mounted pin puller, and an attachment for placing center-joint ties, made this one of the more unusual spreads working in the area. A short distance to the east, several contractors were building bridges and grading for the Oklahoma Northeast Turnpike, and at the same time, another crew was grading and paving a section of multilane concrete pavement on U. S. 66, improving the road from Claremore to a point several miles to the south.

U. S. 66 is being brought almost to freeway standards under a long-range program by the Oklahoma State

Highway Department. Although the new Northeast Turnpike will run about parallel to the route, from the Northeast section of the state to Tulsa, heavy local and through traffic is not expected to decrease. In fact, existing evidence indicates that the turnpike will spur an even heavier flow of local traffic on parallel and feeder routes.

The improved highway will have two 24-foot roadways separated by a depressed median in rural areas. In and about Claremore, paved service roads are to provide access to adjacent property. Acceleration and deceleration lanes are provided for

traffic entering or leaving the highway at the city. An adjacent parallel railroad restricts access from one side, and only a few local roads cross the highway at grade.

Base material

The job at Claremore, handled by Jack Briscoe, Contractor, Stillwater, Okla., utilized an unusual material for base and subbase courses, so the contractor had an unusual roller for this phase of the work. Though specifications called for a subbase of 8 inches of pit-run gravel and a 4-inch sand base course, Briscoe found it more economical to build the entire

12 inches of base and subbase of a medium-hard sandstone obtained from a pit adjacent to the job, and he got this change approved. Some of this material was loaded directly from the pit with the Bucyrus-Erie 38-B shovel; in other areas drilling and shooting were necessary before the shovel could dig into the material. Drilling was done with hand-held jackhammers powered by a 105-cfm compressor where required. Rock loaded into three end-dump Euclids ranged from very fine pulverized material to big chunks just able to pass through the 1½-yard bucket of the shovel. A substantial portion of the



How to choose the BEST Portable Generator

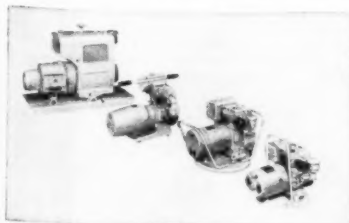
The best generator for your money is dependable; trouble-free; lightweight, but sturdy; and the right size for you.

Sure. But how do you know that when you see it?

Well, you'll look for the best engine you know of... nothing less than a Briggs & Stratton or Wisconsin... connected directly to the generator. That combination means the least trouble; most dependability.

You'll check the facts on weight and sturdiness for the size generator you want and be sure service and parts are nearby.

And you'll find, if you choose carefully, that you've picked a MASTER generator... so you'll call your Master distributor. He has what you want.



EIGHT NEW GREAT MODELS

All are portable with air-cooled, automatically governed, 4-cycle Briggs & Stratton or (on larger sizes) Wisconsin engines. From 750 watts to 5 KW; AC or DC. Dual voltage available. Write for specifications or see your Master distributor.

MASTER

MASTER VIBRATOR COMPANY
242 Stanley Avenue, Dayton 1, Ohio

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MARCH, 1956



Save UP TO 50%

in man-equipment hours

with
the
new...



HYDRAULIC TRUCK LOADER

- Loads itself—or others
- 3,000 lb. capacity
- Years of proven performance

The LoDaL hydraulic truck loader can load itself and other trucks as well. Loads the heaviest types of material in just a few minutes. On short haul and scattered yardage operations, the LoDaL will outperform other types of machines. Unmatched economy with ONE MAN and ONE MACHINE... for such jobs as loading sand or gravel, street repairs, sweeper pickup, rubbish collection, leaf loading, coal handling, cinder removal, snow removal... and many other daily tasks.



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LODAL, inc.

NORWAY • MICHIGAN

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A Cat D6 tractor-dozing knocks down piles of sandrock base and subbase material as it pulls a 15-ton roller made of four threshing-machine wheels filled with concrete. Steel grousers of the wheels help break up and compact the rock.

C&E Staff Photo

rock was still in fairly large chunks. When Euclids dumped this rough material directly on the finished sub-grade in long low piles, it looked more like material that should be fed to a primary crusher than pavement base material. However, a Caterpillar D6 tractor-dozing and a special shop-built roller soon reduced the rock to a very satisfactory base material.

The special roller was made from four large steel drive wheels of old steam threshing engines. The four wheels were mounted side by side on an axle, which had a frame resembling that of a sheepfoot roller. The wheels were then filled with concrete for weight and fitted with new steel grousers that helped chew up the rock.

As the D6 tractor pulled the big 15-

ton roller over the rock, the operator used the dozer to spread the material. After the roller made a few passes, motor graders were able to handle the material, even though it still contained many chunks. The sandstone was then spread in thin layers by a Caterpillar No. 12 motor grader, watered, and rolled with a smooth steel roller. This second roller, also made especially for this contractor, was 6½ feet in diameter and 6 feet wide. The shell of the drum was fabricated of 1-inch plate, and the drum could be ballasted with water to bring the total weight to about 9 tons.

The base was usually built up to its full 12 inches in about 6 lifts. After being finished to grade by the motor grader, it was very dense and provided a good riding surface for trucks and paving equipment.

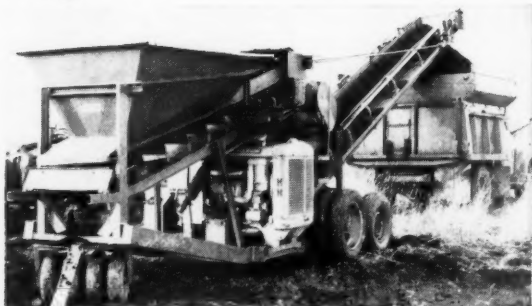
Briscoe started this job with 4,000 feet of new General Road Machinery Inc. 8-inch paving forms, but he also had a supply of older 9-inch forms on reserve. Forms were set in the channel prepared by a Cleveland form trencher, and the base under them was compacted with a Cleveland form tamper. Form pins were driven by an Ingersoll-Rand rivet hammer with a 1¼-inch head. Air for the hammer was supplied by a LeRoi 105-cfm Tractair.

An R-B power finegrader, riding the forms, cut the base to true shape and grade. As the finegrader shaved off the small pieces of sandrock, the base came to look like a large piece of terrazzo made of oversize pieces in a number of shades of brown. This surface was rolled by an Ingram 5-ton three-wheel roller that worked ahead of the paving train.

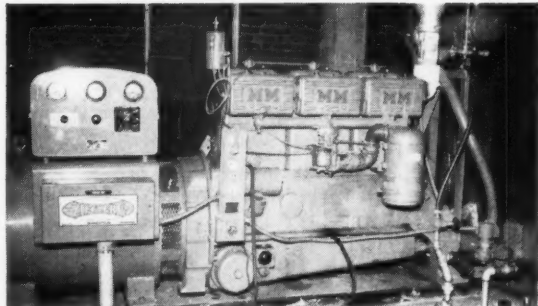
Special joint assemblies

Workmen set the joint assemblies for transverse contraction and expansion joints on the finished base ahead of the paver. Assemblies for

High-Production Equipment deserves Honest HP



MM 283-4A gasoline engine powering a Lindig Soil Shredder. Compact, easily installed MM engines provide a permanent, integral power source for a wide range of portable equipment.



MM 800-6A natural gas engine drives a 75 KW direct-connected generator. Equipped with automatic remote control, this unattended stationary plant supplies regular or standby power.



MM 605-6A gasoline engine supplies low-cost power for this big-capacity American stationary hoist. High torque MM power units respond with steady rpm to intermittent or changing loads.



MM 403-4A gasoline engine mounted on a Warner-Swasey Gradall. Choice of gasoline, diesel, LP gas, natural gas or distillate fuel equipment offers continuous-duty MM power at lowest fuel costs.

Here's how builds Honest HP

High-turbulence combustion chambers provide complete fuel mixing for progressive burning.

Crankcase ventilated by oil-bath breather vacuum lines from valve covers direct to intake manifolds... eliminates sludge

Stellite exhaust valve inserts, extra valve lift for maximum fuel charge, high torque power at moderate engine speeds.

Large bearing size in ratio to bore minimizes bearing load... cuts wear and maintenance.

Oversize full-flow oil filters in base pan provide season-long capacity.

Thermo-clad water-blanketed base pan and bypass cooling maintain uniform top-to-bottom engine temperature.

Cast base pan and wide flywheel flange give effective 360° rear main bearing support. Crankcase extends nearly 4 inches below crankshaft center line.

MM ENGINE SIZES

4 Cylinder Carbureted Models*		6 Cylinder Carbureted Models	
MODEL 206A-4A	3½" x 5"	MODEL 425-6A	4¼" x 5"
MODEL 283-4A	4¼" x 5"	MODEL 605-6A	4¾" x 6"
MODEL 403-4A	4¾" x 6"	MODEL 800-6A	5¾" x 6"
4 Cylinder Diesel Models		6 Cylinder Diesel Models	
MODEL D-283-4A	4¼" x 5"	MODEL D-425-6A	4¼" x 5"
		MODEL D-605-6A	4¾" x 6"

*Engineered for gasoline, distillate, natural or LP gas.

Honest horsepower is horsepower developed at operating speeds that are practical for heavy continuous duty. That is why Minneapolis-Moline engines are designed to develop maximum torque at around 1000 rpm and are power rated at from 1200 to 1400 rpm. Deep-pocket, high-turbulence combustion chambers for progressive fuel burning and prolonged pressure combined with large displacement and high compression ratios enable MM engines to deliver work-type power at usable speeds. Where special installations require higher rpm with rapid acceleration, MM engines can be furnished with aluminum pistons.

MM engines are stocked in various fuel models and standard equipment bundles for quick delivery. You can buy bare engines, engines with radiator, fan and power take-off, or complete enclosed units. Modification of standard units on separate production runs to meet special requirements are part of the flexible MM operation that saves you time and money.

If your design calls for long-run industrial engine power that will last the life of the equipment, we will be pleased to furnish a prompt quotation and shipping date for a pilot model built to your specifications.

MINNEAPOLIS-MOLINE
INDUSTRIAL DIVISION
MINNEAPOLIS 1, MINNESOTA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 337

NOTICE TO BUYERS OF NEW ROTARY SWEEPER BROOM CORES

We Manufacture NEW Cores of the following types:

★ LITTLEFORD ★ DETROIT-HARVESTER
★ HOUGH ★ CRACE ★ ROSCO
★ FORDSON ★ SPEARSWELL ★ LULL
★ HUBER ★ MELI-BLUMBERG
(Special Cores Made to Order)

We Rebuild Repair all Makes Types-Sizes



Immediate Shipment SAVE MONEY

Suggestion! Buy Cores without any filling or we can furnish filled with steel spring wires—Bass—Palm or Hickory Fibres.

ROAD BUILDERS IT'S SENSATIONAL!

BIG **PECKERWOOD** BIG

Steel (or Fibre) road drag levelers Made in any c-o-n-f-i-n-u-u-s length up to 12 feet. 6 inches wide—kiln dried hardwood

NO FRAME REQUIRED



We offer also (not illustrated) The LITTLE PECKERWOOD unit steel wire drag 3" x 15". Fits standard frame

Road Contractors Headquarters Since 1928
VAN BRUSH MFG. CO., INC.
327 Southwest Blvd., Kansas City 8, Mo.

For more facts, circle No. 338

CONTRACTORS AND ENGINEERS

expansion joints consisted of 1-inch redwood boards, shaped to the crown of the roadway, with Star lug load-transfer devices attached. The assembly was held in place by templates secured with long stakes driven into the base. These templates were removed after the concrete had been placed.

Assemblies for the transverse contraction joints were similar, except that the redwood board was only 1½ inches high. This provided a complete separation for the bottom 1½ inches of the 8-inch slab at these joints. Later a saw cut was made from the top to a depth of 1½ inches to complete the joint.

Where additional lanes were to be placed adjacent to the 24-foot roadway, and where a concrete curb was to be built at the edge of the roadway, a keyway and dowels were provided at the edge of the slab. The keyway was made with preformed Kapco bituminous joint formers. A continuous row of the Kapco joints was set up against the paving form and held in place by steel pins that were passed through holes in the keyway section and driven into the base. Dowels bent at right angles were inserted through holes in the keyway former so that the portion which was to be imbedded in the succeeding slab or curb laid in the keyway. Later when the forms were removed, these bars were straightened out.

Where no curbs were to be built, the outside edges of the paving slab were reinforced with two ¾-inch rods. These were continuous except at expansion joints. The rods were held in place in special jigs attached to the paving forms. After the concrete had been placed, the jigs were removed, leaving the rods in the proper location in the slab.

Paving train

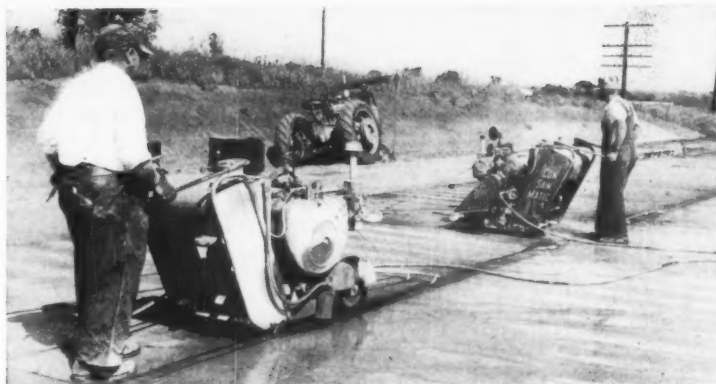
Concrete mixed in a Koehring 34-E

Twinbatch paver operating from the shoulder of the road was placed on the grade by the paver and distributed uniformly across the section by a Blaw-Knox blade-type spreader. A vibrating tamper bar attached to the rear of the spreader was powered by the spreader engine.

The Blaw-Knox finisher following the spreader had a rear-mounted drum-like attachment for placing the center-joint tie bars. This attachment, made in the contractor's shop, was based on an idea obtained from a paving contractor in a neighboring state. The drum placed the ½ × 30-inch tie bars in the slab at 30-inch spacings and to the proper depth.

After a new Koehring longitudinal

(Continued on next page)



Two Clipper ConSawMatic concrete saws with Clipper abrasive blades saw longitudinal and transverse contraction joints 1½ inches deep in the 8-inch slab. Concrete was sometimes sawed as early as 4 hours after it was placed.

C&E Staff Photo



WICKWIRE ROPE DISTRIBUTORS WEAR MANY HATS



The answer to successful use of

HIGH STRENGTH STRUCTURAL BOLTS

This impact wrench calibrator makes it easy to accurately tighten every bolt to specified tension. Permits on the job determination of wrench performance. Simple adjustments are then readily made to make the wrench stall when proper tension is reached.

- ACCURATE • PORTABLE • RUGGED •
- PROMPT DELIVERY •

Write for bulletin 102

SKIDMORE-WILHELM
Manufacturing Company
442 Green Rd., Cleveland 21, Ohio

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Wickwire Rope distributors are men who wear many hats. They are at home in the headgear typical of the numerous and varied industries they serve—the marine and fishing trades, the oil fields, construction, logging and many other industries having specialized wire rope needs.

These men aren't hat models—they can wear these hats because of their long experience in the industries they serve. Add to this their intimate knowledge of local conditions and their comprehensive Wickwire Rope stocks, and you'll see that your Wickwire Rope distributor is the man who can be of great help to you.

Yes, your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and wire rope slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.



3154

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION
For more facts, use Reader-Reply Card opposite page 18 and circle No. 340

(Continued from preceding page)

float passed by, the finishers removed minor irregularities by hand. The last machine in the train a Flex-Plane

unit, performed three operations. It applied a belt finish; sprayed a coating of Best Cure curing compound to the concrete; and placed a black iron oxide center-line marker. This mate-

rial was scratched and rubbed into the surface by a hand float.

Sawing operations

The longitudinal center joint and transverse contraction joints were sawed by two Clipper ConSawMatic self-propelled concrete saws using Clipper 14-inch abrasive blades. In warm weather, sawing operations started about four hours after concrete was placed and continued until all concrete placed that day had been sawed. Since this work often continued after dark, a trailer carrying three 1,000-watt floodlamps and a Jackson 5-kva generator was kept on the job to provide night illumination.

Joints were cut to a depth of 1½ inches; the Clipper abrasive blades averaging 1,400 to 1,500 linear feet of cut per blade. Some blades cut more than 1,800 feet in this limestone-aggregate concrete before they were worn too small.

Another shop-made rig used on this job was an attachment for pulling form pins. A beam was mounted across the top of the International Model M wheel tractor so that it projected well out to the right side of the tractor. The beam, hinged to the tractor at one end, was raised and lowered by a hydraulic ram that was attached to the tractor and powered from the tractor engine. A cable hanging from the end of the beam had a simple clamp to grasp the pins.

This rig moved quickly from one pin to the next, pulling them straight out. Bending and beating of pins was avoided, and forms were not jarred or the fresh concrete damaged. As soon as the forms were removed, the edges of the slab were sprayed with curing compound applied with a hand spray. The sawed joints were filled with Allied hot-poured joint sealer, which was placed by hand.

Batch plant

Materials for the concrete were dry-batched from a plant on the rail siding at Claremore. Cement received in bulk cars from Dewey Portland Cement Co., Dewey Calif., was handled in a Johnson dutch mill plant with a 150-barrel storage silo. Crushed limestone coarse aggregate was furnished by Steinberg-Boyd Construction Co., Tulsa, from a quarry about eight miles from the job. Sand was shipped from Arkansas River Sand Co., Tulsa, by rail.

Aggregates were batched from a two-compartment 60-ton Butler bin fed by a Northwest Model 41 crane and Erie 1½-yard clamshell bucket. A Caterpillar D6 tractor-dozzer assisted on the stockpiles. Nine hired batch trucks hauled the dry batches to the paver.

Water from the Claremore municipal system was hauled by Ford F-600 trucks with 1,200-gallon tanks. A truck was connected to the paver by a cable so that when the paver moved, the truck followed. This eliminated the danger of a hose connection being broken, and it required that the hose connection be only long enough to reach between the tank and the paver. There was no excess hose lying on

the ground, subject to damage.

A typical 37.4-cubic-foot batch contained:

Crushed rock	2,925 pounds
2½-inch maximum	1,634 pounds
Sand	781 pounds
Cement	

When paving was completed, the shoulders were built up with a 6-inch lift of stabilized crushed rock. In the typical rural section, the inside shoulders were 8 feet wide and the outer shoulders, 10 feet wide. In the rural section also, the finished shoulders were given a double bituminous surface treatment. In urban sections, the shoulders were surfaced with a hot-mix bituminous surfacing.

The job also included the placing of 58,183 square yards of sodding on ditch slopes and around culverts. Sod

Pre-cast



Secured by four 1¼" Richmond Screw Anchors, this 25 ton girder is lifted into place in first fully pre-cast, prefabricated building in the New England area, designed by Universal Engineering Corporation and built by the David Nassif Company, both of Boston. Placement of the 8-ton column on the left was accomplished with one 1¼" Richmond Screw Anchor imbedded vertically in the column head. Casting of all the pieces necessary for the complete construction of the 51,000 square foot building through production-line assembly of pre-cast walls, panels, girders and beams took only six weeks. In all concrete construction work, Richmond equipment guarantees speed and safety.



All segments of the building, like this 12 ton panel held in secure check by 4-1¼" and 4-¾" Richmond Spider Anchors for lifting and bracing, were cast flat and swung into position by means of frames or I-beams attached to Richmond Anchors which had been cast into the concrete panels. Richmond anchorages with their established safe load strength and absolute reliability are a natural for all such prefabricated concrete assemblies.

For more information and your copy of Richmond's 1955 Catalogue showing the complete line of Richmond products applicable to all types of concrete construction, write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 South 4th St., St. Joseph, Mo.

For more facts, circle No. 343

CONTRACTORS AND ENGINEERS



Sargent MODEL 410 TRENCH HOE

A ¾ yd. rig—designed and built to let the best operator perform faster, better. Interchangeable 20", 25" or 30" buckets as well as backfill blades help you speed up work as necessary.

NEW! Heavy-duty goose-neck boom. Gives the "410" more lift than other similarly rated machines. **NEW!** Improved cab. Easier access to controls. (Separate, removable panels) **NEW!** Two-shoe (split-type) clutch for longer life, more trouble-free operation. **NEW!** Heavy Cut Teeth in Bow Gear.

WRITE today for specifications and prices.

Sargent Engineering, Inc.
FORT DODGE, IOWA

**Trench Hoes • Cranes
Shovels • Draglines**
Truck or Crawler Mounted

For more facts, use Reader-Reply Card opposite page 18 and circle No. 341

MODEL SP



Jack over axle models. Capacities 11 through 25 tons.

MODEL GPX-D



Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.

MODEL TT



Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.

A TRANSPORT TO FIT EVERY NEED... BETTER*

*PROVED BY MILLIONS OF MILES

MODEL KS-F



Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.

MODEL GPR



Removable gooseneck. Tandem, triple or trunnion axles. Flat or drop decks, or as beam trailers.

MODEL GTX



Triple axle, 6 dual wheels. Capacities 25 through 45 tons. Flat or drop deck.

MODEL T-8-18



14 or 18 foot length between the wheel tilt trailers. 8-10 ton capacity.

MODEL PS



Single axle, spring mounted platform or float.

MODEL PX



Heavy-duty tandem axle, spring mounted platform or float.

MODEL KSO-D



Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.

MODEL MSO-D



Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.

MODEL GXTT



Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

MODEL XTT



Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.

DUMP TRAILERS



Single or tandem axle models. Standard capacities 8 through 15 yards.

WRITE FOR FREE CATALOG OF COMPLETE LINE

Nationwide Sales and Service—Distributors in Canada and foreign countries

"TRANSPORTATION ENGINEERING A SPECIALTY"



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Another shop-made attachment, used on an International M wheel tractor, pulls pins from paving forms. As the clamp grasps the head of the pin, the hydraulic cylinder raises the crossbeam, which pulls the pin out in a single motion without damaging either pin or fresh concrete.
C&E Staff Photo

Six-wheel trucks

Information on International six-wheel trucks—both conventional and cab-over-engine models—is contained in a new catalog from International Harvester's Motor Truck Division.

The design and operating features of the line, which includes S-line, R-line, and CO models powered by gasoline, diesel, or LPG engines, are discussed in some detail.

International six-wheelers, manufactured as straight trucks or as tractor-trucks, range in gvwr ratings from 22,000 to 60,000 pounds, and in gross combination weight ratings from 35,000 to 65,000 pounds. Other models, in the "400" series range up to 90,000 pounds gvwr.

To obtain this literature write to

the Motor Truck Division, International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 168.

Compressor tools

Worthington Corp. has issued a mailing piece on digging, paving-breaking, and rock drilling tools, and backfill and Triplex tampers. Pictures of the models, data on their uses, and weights are given. A chart lists six Blue Brute compressors—60 to 600 cfm—and the number of these tools that each will operate.

To obtain this mailing piece write to Worthington Corp., Worthington and Harrison Aves., Harrison, N. J., or use the Request Card at page 18. Circle No. 22.

was placed on the slopes in 10-inch strips spaced 30 inches apart to control erosion. A summary of other contract quantities includes:

Excavation	76,000 cubic yards
Base and sub-base	60,036 cubic yards
Concrete pavement, 8-inch	75,235 square yards
Concrete pavement, 7-inch	16,034 square yards
Curb	15,000 linear feet

The contract price was \$690,556.42.

Personnel

The superintendent for Briscoe on the project was James A. Bollinger. Grading and base operations were supervised by Wayne Brooks. Frank Briscoe was also on the job a good deal of the time. The Oklahoma Highway department was represented on the job by resident engineer S. H. Shelden and chief inspector Fern Ford. The construction engineer for the department is J. J. Stobaugh, Jr., and the chief engineer is G. H. Bittle.

THE END

New arc welder weighs 65 pounds

A folder announces Kasson Die & Motor Corp.'s new hand-portable arc welder for construction and truck-repair work. Weighing 65 pounds, this welder operates on 110 or 220 volts ac at 60 cycles. Rated at 200 amps, the Bren-Weld will deliver 250 amps at reduced duty cycle.

To obtain this folder write to Kasson Die & Motor Corp., 32-14 Northern Blvd., Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 27.

Line of chain saws

Gear and direct-drive chain saws for maintenance, construction, and land clearing are described in a catalog from Strunk Chain Saws, Inc. These models, which range in weight from 25 to 29 pounds, have horsepower ratings from 2.5 to 5.5. Complete specifications and details on accessories are included.

To obtain this catalog write to Strunk Chain Saws, Inc., Coatesville, Pa., or use the Request Card at page 18. Circle No. 16.



Paving operations near Allentown. Contractor for this section is John H. Swanger, Inc., Lancaster, Pa.

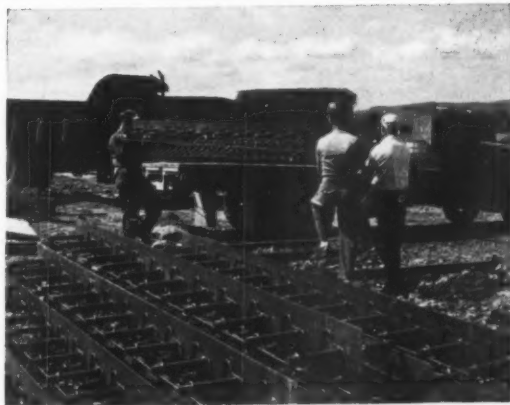
Pennsylvania Turnpike Heads North

The port and industrial facilities of Philadelphia are being linked to the anthracite coal regions and the Pocono Mountain resort sections to the north by the 110-mile-long Northeastern Extension of the Pennsylvania Turnpike.

Beginning at Plymouth Meeting near Philadelphia, the new extension will by-pass major communities and push north to Scranton to a junction of U. S. Routes 6 and 11. Eventually the highway will be extended to the New York State line.

The Northeastern Extension will be a 4-lane limited-access dual highway. Lanes will be 12 ft wide with a 10-in. concrete slab.

Bethlehem, which is well-represented on all sections of the Pennsylvania Turnpike, is supplying dowel units, reinforcing steel, bar mats and other highway steels for the road bed. In addition, Bethlehem structural shapes are being used in the construction of bridges and overpasses, and Bethlehem guard rail will protect motorists and truckers along many miles of the superhighway.



Light-weight, easy-to-handle Bethlehem dowel units are unloaded from truck.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM STEEL

For more facts, use Reader-Reply Card opposite page 18 and circle No. 344



STILL ANOTHER USE for the Drott TD-9 Skid-Shovel is found by Hammersla Brothers, Inc., Baltimore, Md., during work on a 40-acre housing development near Baltimore. The unit takes about 1½ yards of concrete from transit-mix trucks and discharges it directly to footings.



LIGHT STEEL FRAMING MEMBERS give shape to the Chrysler plant in Detroit. The Manitowoc Speedcrane, right, raises lath to the upper floor. Lightweight gypsum plaster, applied over the lath, will make the plant fireproof and keep dead load to a minimum.



SNUG TO THE WALL of a railroad underpass is the trench being dug by this compact Cleveland "Baby Digger." Its ability to put the edge of a trench within less than two feet of a parallel wall is but one of this Cleveland's many practical operating advantages.



DIGGING CLEAN AND FAST the same Cleveland "Baby Digger" turned out high daily production on this job. With more than 30 usable digging speeds at the operator's command, the Cleveland cut cleanly through pavement and heavy root growth for trench 22 inches wide by 41 inches deep.

Talk it over with your Cleveland distributor

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio



For more facts, use Reader-Reply Card opposite page 18 and circle No. 345

New graders are efficient, easier to operate with torque converter, power-shift transmission

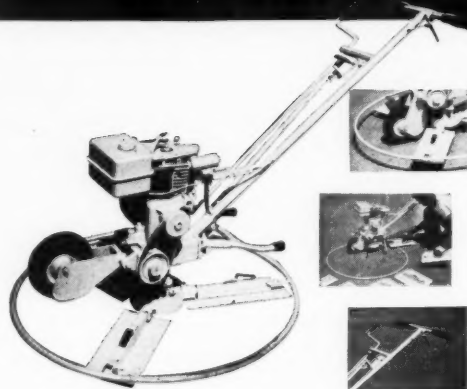


■ Two new motor graders featuring a torque converter and full power-shift transmission have been announced by the Huber-Warco Co., 202 N. Greenwood St., Marion, Ohio. These are the 140-horsepower Model

7-D and 100-hp Model 6-D.

The combination of a torque converter and power-shift transmission on the new units results in more usable power for the machines, increased ease of operation, and pro-

Only one man to move a White TROWELER

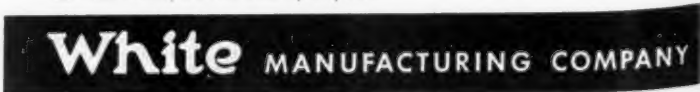


Retractable wheel, up to trowel, down to move.

Remove blades and ring in seconds... for cleaning, changing blades, or moving through doorways.

Adjust blade pitch during rotation from handle. Safety throttle control stops rotation if operator lets go handle.

PORTABILITY, patented, exclusive! PERFORMANCE, unbeatable! PRICE, comparable to trowelers without these features! Model T-1, 36" diameter, Patent No. 2,621,568.



ELKHART 9, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 346

CONTRACTORS AND ENGINEERS



GROUND FOR THE LAKE CALUMET HARBOR PROJECT near Chicago, Ill., is cleared by this Michigan 2 1/4-yard tractor shovel, which moves an average of 1,125 yards of open-hearth slag daily. A fleet of trucks is hauling the material away on this 700,000-yard land-clearing job being handled by C. J. Wilson, Chicago, Ill.



WITH A PUSHING ASSIST from an International tractor-dozzer, a Euclid scraper picks up a load of dirt for a grade-separation structure on U. S. 29 near Greensboro, N. C. Grading on this highway relocation is being done by J. K. Cecil & Son, Lexington, N. C.

tection for all mechanisms. Also, the combination provides greater work-load capacity and greater variations in torque output than before, with only four forward and four reverse speeds.

The power-shift transmission itself permits quick shifts under full load at wide-open throttle without interrupting power flow from the engine to the load.

Also standard on both grader models is a power sliding moldboard, operated hydraulically from the cab. It allows an operator to power-shift the moldboard out of the way as he approaches a culvert or post and then power-shift it back to its exact former position—all without leaving the cab or slowing his progress.

Complete hydraulic control of every working position—entirely governed from the cab—is another feature. The operator can attain a high bank-sloping angle up to 90 degrees on either side. The blade can be ro-

tated 180 degrees without removing the scarifier teeth.

Both the 7-D and 6-D boast hydraulic booster steering that retains the positive feel of manual steering, and reverts automatically to manual operation in case of a power or hydraulic failure.

Other features include an all-welded frame with high-arched design to give more space for blade movement and better visibility of the blade area; an extra-heavy front axle with the steering knuckle made from a heat-treated steel forging; a heavy-duty final drive with all gears and shafts forged of heat-treated steel; interchangeable hydraulic cylinder components; and, on the 7-D, four-wheel brakes.

Big 14.00 x 24 ten-ply tires are on the 7-D and 13.00 x 24 eight-ply tires on the 6-D.

For further information write to the company, or use the Request Card at page 18. Circle No. 153.



No time lost

Hartford moved fast to replace our wrecked dragline

(Based on Company File #HS44129)

The driver hauling our dragline didn't have much choice when the air brakes on his tractor-trailer failed on a steep downgrade.

Should he go off the road—and risk plunging over the embankment? Or jack-knife truck and trailer and take his chances?

He decided to jack-knife. The chains holding the dragline to the lowboy snapped. Off went the rig,

crashing heavily on its side. Fortunately, our man came through okay.

And, I might add, so did our Hartford Fire Insurance Company Agent. But in another way, of course. *He didn't let any grass grow under his feet in arranging for settlement of our claim.* With his help, the actual amount of damage was quickly agreed on—and a check promptly given us for \$5,450!

On the job... off the job... in transit... you never know where an unforeseen accident may overtake your equipment.

But you can know where prompt help is coming from! Hartford is set up to save you costly time losses. You know how they can mount up!

So play safe. See your Hartford Fire Insurance Company Agent or your insurance broker now. And have prompt, satisfying Hartford help on tap when you need it!

Year in and year out
you'll do well with the

Hartford



Hartford Fire Insurance Company
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Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey
Hartford 15, Connecticut
New York Underwriters Insurance Company
New York 38, New York
Northwestern Fire & Marine Insurance Company
Twin City Fire Insurance Company
Minneapolis 2, Minnesota

How much is your equipment worth?

The Hartford Fire Insurance Company has prepared a free booklet, *Your Machinery and its Actual Cash Value*. Send for a copy. It may help you avoid a big loss.

HARTFORD Fire Insurance Company
Hartford 15, Conn. Dept. 11

Name _____
Firm _____
Street _____
City _____ Zone _____
State _____

For more facts, use coupon, or circle No. 348

SAVE TIME, MONEY, LABOR WITH THESE STURDY PUMPS

★Just turn the high pressure hose on that heavy equipment for a quick clean-up. The solid, hard, driving, high pressure stream from a Hardie Powered Pump Unit will strip off the caked mud, grease, dirt—even that "behind the ears"—in a matter of seconds.

★The Hardie Spray Gun is readily adjustable by a pressure of the fingers from solid stream to a high pressure spray for over-all washing, or a fog like mist for fragile things and fog fire fighting.

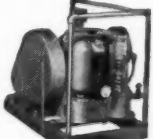
★Hardie builds powered pump units in many sizes and models. Enclosed units from 5 gpm at 300 psi to 24 gpm at 400 psi. On casters or skid mounted units up to 60 gpm at 800 psi. Handle all liquids, chemicals, semi-liquid materials. All Hardie pumps are trouble-free, rugged, vertical piston-type pumps that work to their ratings smoothly, quietly, at slow speed.



Enclosed unit.
All working parts are
readily accessible.



Model LC—Delivers
50 gpm at 800 psi.



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18 gpm at 600 psi.

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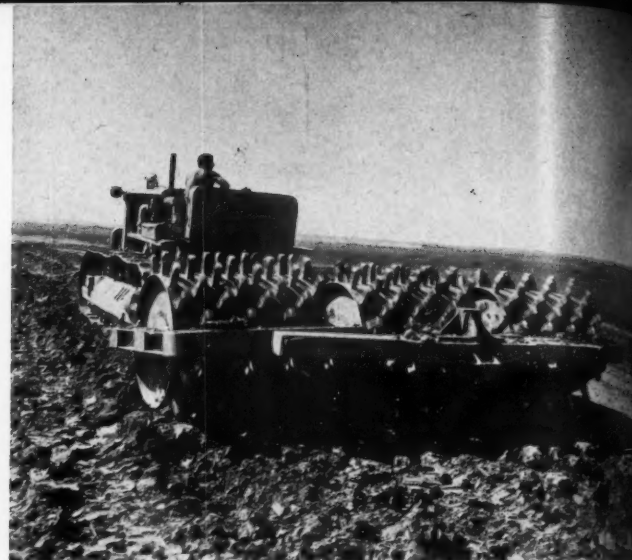
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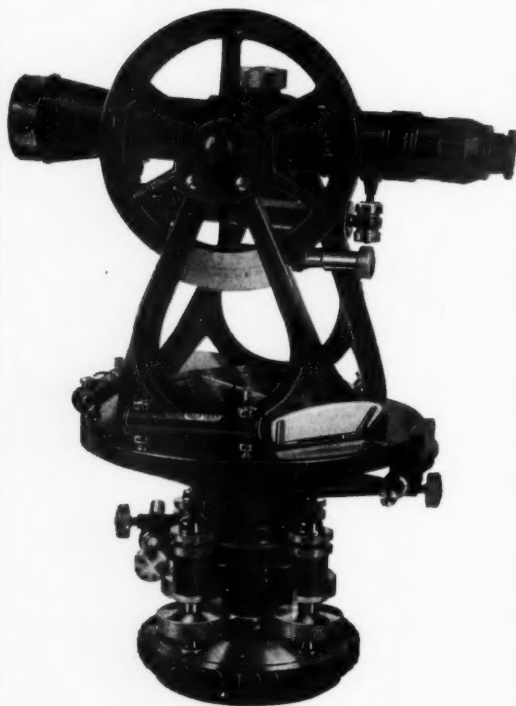
FORMS AND REINFORCING for the 90-foot-high concrete columns on the Tide Water Associated Oil Co.'s Flying A refinery near Wilmington, Del., are set by a Manitowoc Speedcrane before the initial pour. The new installation rests on a foundation of reinforced concrete.



A SET OF THREE Bros sheepfoot rollers pulled by a Cat D8 tractor compacts the heavy yellow clay in Great Northern's new freight classification yard at Minot, S. Dak., to 95 per cent proctor density. The 7-mile-long yard is being built by Megarry Bros., St. Cloud, Minn.

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20 Years of Proven Consistency • Accuracy • Service In the United States



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Produced by the foremost manufacturer of engineering, surveying and mapping instruments in the Far East.

These transits are the most popular rental transits in the United States. Knowledge of instruments dictates that a rental transit must be accurate, easily serviced and rugged. Sokkisha Transits have these qualities and more.

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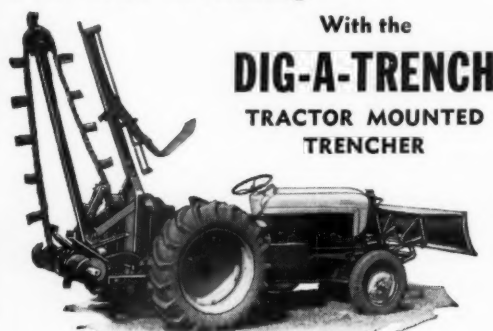
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For more facts, circle No. 349

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With the **DIG-A-TRENCH** TRACTOR MOUNTED TRENCHER

Low Original and Repair Costs.

Digs trenches up to 5½ ft. deep, 7½" or 10" wide. Speeds up to 350 ft. per hour.

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Anywhere a trench is needed

Mounts on Late Model Ford Tractor

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Grand Mound, Iowa

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MIAMI BEACH

For more facts, circle No. 351

CIMA elects officers

Over 160 manufacturers of construction machinery attending the annual convention of the Construction Industry Manufacturers Association have elected officers of the association. Kenneth Lindsay of the Iowa Mfg. Co., Cedar Rapids, Iowa, was re-elected president, and William A. Nugent of the Thor Power Tool Co., Aurora, Ill., was re-elected to the post of secretary-treasurer.

Elected to serve as first vice president is Frank J. Whelan, of the Worthington Corp., Harrison, N. J. Second vice president is Clarence E. Killebrew, Construction Machinery Division of Clark Equipment Co., Benton Harbor, Mich.

Seven new members were elected to serve three-year terms on the board of directors. The members and the companies they represent are: Henry Barnhart, Baldwin-Lima-Hamilton Corp., Lima, Ohio; Ben F. Lease, Athey Products Corp., Chicago, Ill.; J. W. McCoy, E. D. Etnyre Co., Oregon, Ill.; R. E. Montgomery, The B. F. Goodrich Co., Akron, Ohio; Boyd S. Oberlink, Allis-Chalmers Mfg. Co., Milwaukee, Wis.; John W. Schoen, LeTourneau-Westinghouse Co., Peoria, Ill.; and Virgil L. Snow, Euclid Division, General Motors Corp., Cleveland, Ohio.

Harold T. Reishus of the Industrial Power Division of International Harvester Co., Melrose Park, Ill., was elected to serve a two-year term on the board. This brings the total number of board members to 21.

The association's meeting was held at Maimi Beach, Fla., in January.

American Cyanamid merges research activities

The American Cyanamid Co., New York, N. Y., has consolidated all of its research activities into a single division, regrouping the activities geographically so that related operations are brought together at the appropriate research laboratory. Kenneth H. Klipstein has been appointed division manager.

The plan involves regrouping activities at Bound Brook, N. J., Pearl River, N. Y., and Stamford, Conn.

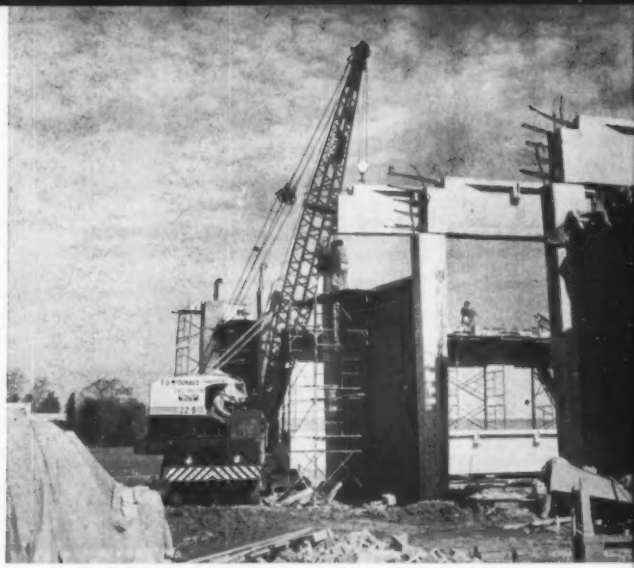
CONTRACTORS AND ENGINEERS



A TRENCH leading from oil field tanks near Kinsbury, Texas, is cut by a Gar Wood-Buckeye 308 ditcher so that salt water produced with the oil can be drained off.



THE FIRST STEP in eliminating a number of grade crossings at Winchester, Mass., includes driving L. B. Foster sheet piling with an air hammer handled by a Lorain. C. J. Maney Co., Lexington, Mass., is the contractor.



ONE OF FOUR 97-foot-long 34-ton concrete roof girders for the Northwest high school, Charlotte, N. C., is set by a Bucyrus-Erie 22-B transit crane. F. D. McDonald, Charlotte, is the contractor for the building.

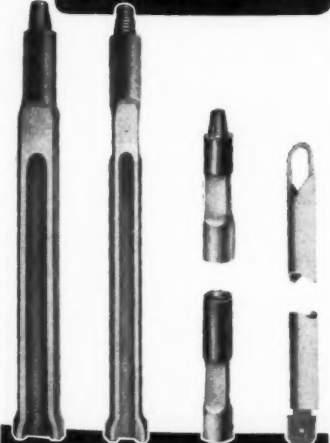
Textbook in surveying

A new text by Philip Kissam, C.E., professor of civil engineering at Princeton University, aims at making surveys more complete and more accurate. "Surveying for Civil Engineers" classifies material by types of surveys rather than by details of operation. Each topic is thoroughly described, developed, and illustrated by several examples.

The book is divided into five main parts covering instruments and methods for large surveys, operations, procedures for precise control, and aerial mapping. Tables of probability, least squares, and the theory of state coordinate systems comprise the fifth part, the appendix.

Charts, diagrams, and formulas make the text easy to follow.

Priced at \$8.50, "Surveying for Civil Engineers" is available from the McGraw-Hill Book Co., the publisher, located at 330 W. 42nd St., New York, N. Y.



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For more facts, circle No. 352
MARCH, 1956

TDA® BRAKES

*where you
have
equipment
to control
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stop...*



THE VERSATILE NEW DLM BRAKE by Timken-Detroit® can offer remarkable help!

Versatility! Flexibility! The revolutionary DLM will serve effectively with a variety of equipment. It has already proved its value as a control or parking brake, and is used extensively on trucks, buses, machinery, farm equipment, cranes, shovels, hoists, golf buggies, and lift trucks.

Highly Efficient! The DLM brake is basically a self-energizing two-shoe brake in which both shoes do the same amount of work—give equal forward and reverse torque output, regardless of drum rotation.

Simpler! Only 8 parts, with interchangeable shoes and springs. Lubrication is not required. No internal adjustment necessary. Enclosed design guards against

entrance of foreign matter and requires only a minimum of maintenance.

Lighter! More Payload Advantages! Improved TDA design using lightweight fabricated steel shoes and brake supports saves many pounds over heavier, more costly brakes.

For additional information and expert consultation about your control or brake problems contact Timken-Detroit® Brake Division. Complete specifications on the DLM are available.

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For every industrial or automotive application
where braking is required!

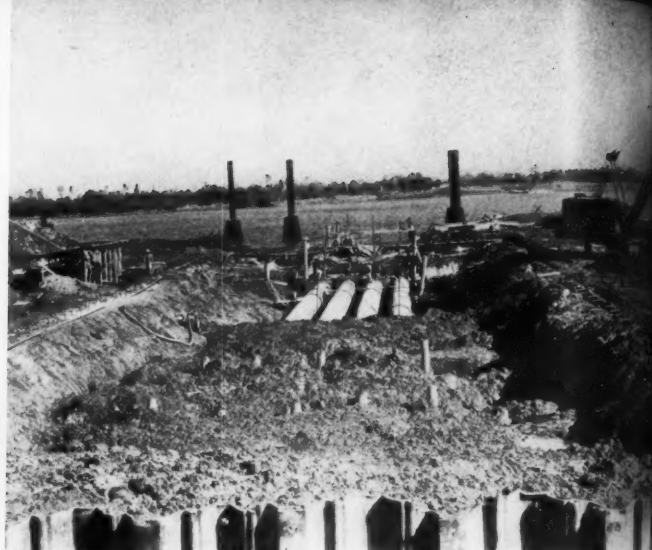
TDA plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania



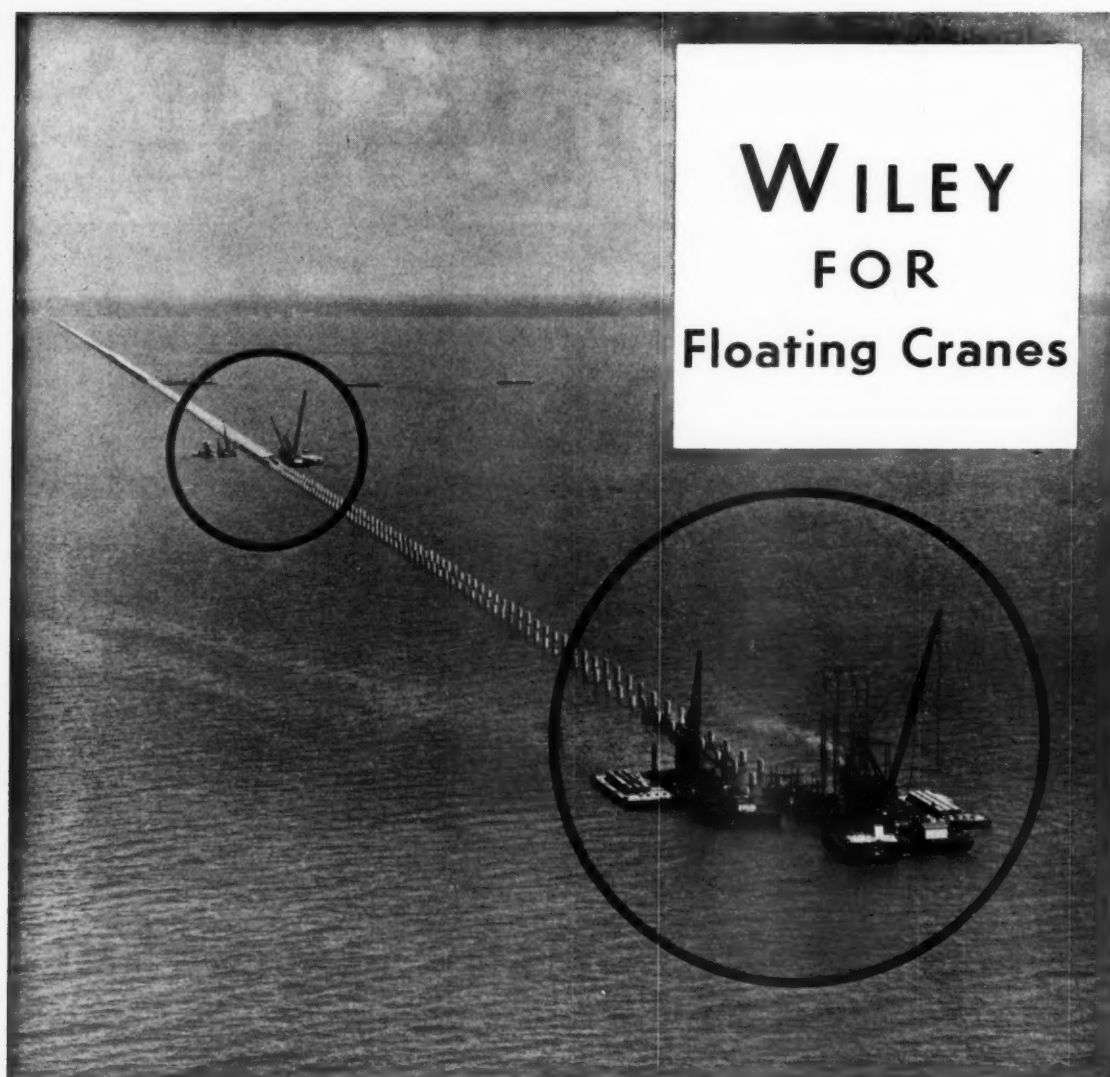
For more facts, use Reader-Reply Card opposite page 18 and circle No. 353



SUBBASE MATERIAL for a 2¼-mile-long runway, a concrete apron, and five taxiways at Kelly Field Air Force Base, San Antonio, Texas, is dug from a borrow pit about two miles from the field by a Lorain Model 85 dragline with 60-foot boom and 3-yard bucket. H. B. Zachry Co., San Antonio, is the contractor.



WORKMEN COMPLETE THE INSTALLATION of four 60-inch wrought-iron intake lines in the levee at the Mississippi end of the Bayou Lafourche pumping plant near Donaldsonville, La. Some 5,000 feet of Byers 60 and 48-inch pipe are being used on the project.



WILEY FOR Floating Cranes

Construction progress continues on the Lake Ponchartrain Causeway, three of four Model 124 Wiley Floating Cranes owned and operated by the Louisiana Bridge Co., are illustrated, serving this construction program.

For dependable Floating Equipment, discuss your requirements with Wiley Engineers.

WILEY

MANUFACTURING COMPANY

BARIUM STEEL CORPORATION SUBSIDIARY

P.O. BOX 97, PORT DEPOSIT, MARYLAND

PHONE: PORT DEPOSIT DRAKE 5-2111

For more facts, use Reader-Reply Card opposite page 18 and circle No. 354

HRB issues new booklet on frost action in soils

Bulletin 111, "Factors Related to Frost Action in Soils," has been released by the Highway Research Board. A compilation of seven papers presented at the board's 34th annual meeting in January, 1955, the book presents an over-all study of the frost problem.

The seven papers discuss: terminology; the relation of climate to frost action; soil moisture in relation to changing climatic conditions; the means of predicting the depth of frost penetration; the means of measuring reduced subgrade strengths which follow thawing; a study of agronomic soil groups as they are affected by frost action; and a theoretical basis for research on frost action.

The booklet, priced at \$2.25, is available from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

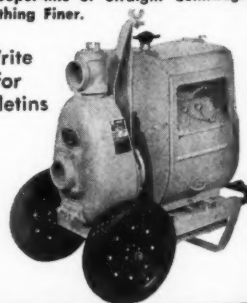
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CENTRIFUGAL & DIAPHRAGM
PUMPS

CENTRIFUGALS—All AGC Sizes 1½" thru 10". Complete Line Light-weights. All Power Options.

DIAPHRAGMS—2", 3" and 4" and the Big Double 4". Coming Soon a Super-line of Straight Centrifugals. Nothing Finer.

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Bulletins



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250 PARK AVE. BELGIUM, WIS.

For more facts, circle No. 355
CONTRACTORS AND ENGINEERS



DESPITE WINTER WEATHER, pouring operations are continued on the water-treatment plant for the Partridge Lakes Development at Hoyt Lakes, Minn. J. S. Sweitzer & Son, Inc., and Lovering Construction Co., both of St. Paul, are using some 12,000 square feet of Symons concrete forms on this job.



EARTHWORK STARTS THE JOB of making U. S. 66 a four-lane divided expressway from Troy, Ill., almost to Chicago, 246 miles away. Arcole Midwest, Skokie, Ill., is using Caterpillar D8 tractors with No. 463 scrapers on the million-yard earthmoving portion of its 7½-mile \$2,500,000 improvement.

Ohio announces figures on highway improvement

The Ohio State Department of Highways has announced that its 1955 highway improvement reached an all-time high of slightly over \$197,000,000—\$6,851,000 for maintenance and over \$190,000,000 in new construction.

S. O. Linzell, director of the department, said that for a period of seven years prior to 1953, the value of construction done by the department averaged less than \$50 million a year. Since that time, the value of construction has been stepped up to \$75 million in 1953, \$115 million in 1954, and \$197 million in 1955.

During this period, costs were not marked by any noticeable inflationary influences.

Construction values in the state are expected to top \$200 million in 1956. A federal program would increase this figure to a considerable extent.

INTERNATIONAL TRUCKS

First choice of men who know 6-wheel costs



Model RF-201, gasoline-powered 6-wheeler, 39,000 lbs. GVW and 65,000 lbs. GCW.

FOR A TROUBLE-FREE SELF-HEATING ASPHALT IRON . . .

THE NEW INSTANT LIGHTING P.L.G. Paver . . .

(Patent Pending)

Liquefied Petroleum gas lights instantly — pre-heating of burner unnecessary.

ECONOMICAL • TIME SAVER TROUBLE-FREE

- **Simple to Operate:**
No complicated working parts
- **Rugged Construction:**
Solidly constructed to stand years of use.
- **Safe To Use:**
Safety valve in tank eliminates danger of blow-up or fire.

Shoe heats to over 650°
Ten minutes faster than other irons.

WRITE—WIRE—COLLECT
For full information and name of your nearest dealer, write

CAMM MANUFACTURING
1425 First St., San Fernando, Calif.
DISTRIBUTOR INQUIRIES INVITED

For more facts, circle No. 356

MARCH, 1956

Now — NEW Gasoline, LPG and Diesels for a total of 101 models

SF-180 Series—GVW rating, 30,000-33,000 lbs. GCW, 45,000 pounds. Gasoline or LPG engines.

RF-200 Series—GVW, 37,000-41,000 lbs. GCW, 65,000 lbs. Royal Red Diamond 212-hp gasoline engine, optional.

RDF-210-H Series—GVW rating, 37,000-45,000 lbs. Diesel-powered. For highway or off-highway service.

RDF-214-H—GVW rating, 45,000 lbs. Diesel-powered. For heavy off-highway service.

RDF-230-H—GVW rating, 60,000 lbs. Diesel-powered. For heavy off-highway service.

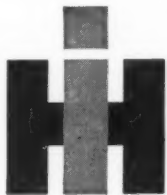
DF-400 Series—GVW rating, 40,000 lbs. GCW rating, 76,800 lbs. Diesel-powered. For highway or off-highway service.

Here are 3 BIG reasons why :

1. **World's Widest Range of 6-wheel Models.** The INTERNATIONAL 6-wheel truck line offers trucks of every size and type from 22,000 to 90,000 pounds GVW—conventional and COE, gasoline, LPG and diesel—all available in hundreds of variations for *exact* matching to the requirements of every job.
2. **Custom-Built on the Production Line.** Years of experience in volume manufacture has created unmatched ability for pinpoint specialization in production line assembly. This means appreciable production savings, and is one of many superiorities that have made INTERNATIONAL the 6-wheel truck leader for 21 straight years.
3. **All-Truck Built to Save You the BIG Money.** INTERNATIONAL 6-wheel trucks are *all-truck* from the drawing board out with every component designed to do a truck job. They *last longer, work more dependably*—to save you the BIG money, the over-the-years operating and maintenance money.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

All-Truck Built to save you the BIG money!



INTERNATIONAL TRUCKS

Motor Trucks • Crawler Tractors • Industrial Power
McCormick® Farm Equipment and Farmall® Tractors

For more facts, use Reader-Reply Card opposite page 18 and circle No. 357



The Ackley air-powered pruner.

Portable brush cutter has 4-inch capacity

■ A new portable air-powered pruner for highway maintenance work has been introduced by Weed Control Service, Inc. The Ackley air pruner

weighs less than 5 pounds, and has an over-all length of 76 inches. Its 7-inch saw blade, located next to the motor, revolves at speeds up to 5,000 rpm

with a cutting capacity up to 4 inches.

The blade as well as an instantaneous vacuum brake are operated by fingertip controls. The Ackley air pruner operates at 140 psi, and uses 17 to 20 cubic feet of air. The unit is also available in an angle-head style for ground brushing.

For further information write to Weed Control Service, Inc., 2605 S. W. First Ave., Portland, Oreg., or use the Request Card at page 18. Circle No. 184.

Rust engineer dies

Rudolf Unfug, an architect-engineer for the Rust Engineering Co., Pittsburgh, Pa., died on February 1, at age 65. He had specialized in refractory brickwork engineering.

Automatic transmission for on-highway trucks

■ An automatic transmission designed specifically for on-highway trucks has been developed by the Allison Division, General Motors Corp., P. O. Box 895, Indianapolis 6, Ind. The CTP-4 transmission is self contained in one package and features a torque converter-type, full power shifting, heavy-duty transmission with six speeds forward and one reverse.

It also has an integral hydraulic retarder for braking action. Controlled entirely by oil, the retarder relieves the service brakes from long downhill duty, controls the descent of the truck and holds it on hills, according to the manufacturer. It will not wear out, and it permits long grade descents faster and without danger of overheating the service brakes. The retarder reportedly provides the operator with a braking force approximately six times greater than engine braking.

Operation of the new CTP-4 is similar to the Powerglide in Chevrolet passenger cars. The Powermatic automatically balances engine power to the performance demand by selecting the most efficient gear ratios. In addition, at least two gear ratios are available in each of the three forward ranges.

The torque converter contains four elements and operates as a hydraulic torque multiplier and a fluid coupling. Its high torque ratio allows starting loads without shocks or excess shifts at low speeds.

The Powermatic's hydraulic control system accurately synchronizes all the shift sequences to provide a smooth, positive flow of engine power from one gear to the next.

For further information write to the company, or use the Request Card at page 18. Circle No. 144.

Scaffolding spring lock

■ Saf-T spring lock scaffolding in end frames from 4 feet 6 inches to 5 feet is the subject of a mailing piece from Carmic Mfg. Co., Inc. Braces, casters, adjustable base jacks, and a hoist are also described.

To obtain this mailing piece write to Carmic Mfg. Co., Inc., 1745-53 N. Second St., Philadelphia 22, Pa., or use the Request Card at page 18. Circle No. 15.

Drafting machine

■ A Swedish-made all steel drafting machine is described in a brochure from the importer, The Walpole Co. The Walpole-Nordquist instrument can be used for drawing plans, scale drawings, and general drafting, or any graphic operation requiring a T-square and triangle. The protractor head, reading from 90 degrees through 0 degrees to 45 degrees, has an automatic lock at every 15 degrees.

To obtain this brochure write to The Walpole Co., 419 Boylston St., Boston 16, Mass., or use the Request Card that is bound in at page 18. Circle No. 61.

CONTRACTORS AND ENGINEERS

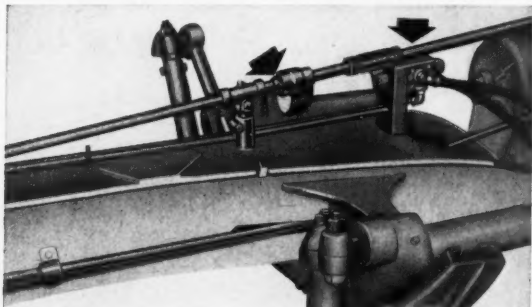
Rivinius

COST-CUTTERS FOR "CAT" 'GRADER WORK ...

Less than \$600.00 for BOTH!
GUARANTEED PERFORMANCE!

1. FULL-TIME POWER STEERING!

fits any "Cat" 'grader—Series 212, 112 and 12 (including the 9K)



Less job time . . . better job quality—that's how Rivinius full-time power steering helps your "Cat" Motor Grader put extra dollars in your pocket . . . and here's why:

- Holds wheels automatically in any position, over any terrain
- Eliminates wheel whip
- Frees operator's hands for handling blade and other controls
- Fully hydraulic
- Easy to install
- Minimum of working parts
- Vickers pump
- Valve located high above dust and other terrain hazards
- By-pass for overload

2. HYDRAULIC MOLDBOARD SHIFT

fits any "Cat" 'grader with sliding moldboard



This separate Rivinius attachment can be teamed with Caterpillar or Rivinius power steering—adding these features to your Caterpillar Motor Grader:

- Operator shifts moldboard from inside cab at the touch of a button! Makes sure position is correct for every application. More effective work on insloping or backsloping.
- Functions whether 'grader is moving or stationary.
- Moldboard can be stopped—locks—at any point—operator no longer limited to five manual slot positions.
- Moldboard moves through full 42" of travel in less than 30 seconds.
- Easy to install . . . minimum of working parts—operates from same pump as Power Steering.

Get complete facts about Rivinius Power Steering and Moldboard Shift from your Caterpillar dealer . . . or write:

Rivinius INC. EUREKA, ILLINOIS

For more facts, circle No. 358

Spray-Lube
for
OPEN GEARS

Spray-Lube Saves 95% of the Lubricant and does a 100% BETTER JOB!

USE SPRAY-LUBE ON ALL GEARS NOT RUNNING IN OIL

- ★ A heavy black petroleum gear compound packaged in a spray container.
- ★ This grease is extreme pressure quality and ideal for the heaviest duty applications.
- ★ Many of the largest industries and contractors use and commend Spray-Lube.
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- ★ No Waste - no muss - no bother - Every drop lubricates completely.
- ★ Spray container saves time and encourages proper gear lubrication.
- ★ Will not drip or throw off gears, but will adhere to any gear in any position.

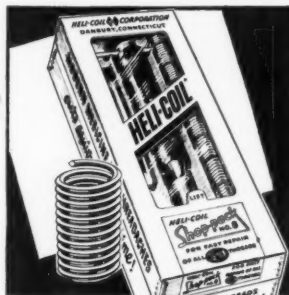
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Order your 12 can case TO-DAY (Satisfaction guaranteed)

PP PRESSURE PRODUCTS CO.
P. O. BOX 342 WEST CHESTER, PA.
Selected Dealership's Available

For more facts, circle No. 359

NEVER AGAIN WORRY ABOUT

screws —
studs —
bolts —
FAILING!



Heli-Coil® Shop-packs give threaded holes positive protection against stripping, seizing, galling, corrosion. They make on-the-spot repairs.

Just drill out old fastening and/or female thread, retap with Heli-Coil Tap, wind in Heli-Coil Insert. In seconds, for pennies, you have original size, better-than-new threads.

Heli-Coil Inserts are made of diamond-shaped, coiled, stainless steel wire. They eliminate plugging, welding, going to larger bolts or studs. Many maintenance men install Heli-Coil Inserts at wear points on new equipment during first overhaul to prevent expensive downtime later.

Your distributor can supply you with handy Shop-pack Kits

for repairing thread sizes 6-32 to 1½-6 NC and 6-40 to ½-20 NF. (Available also for 14 mm spark plug threads.)

Write today for the name of your nearest distributor, and free booklet "24 Happy Maintenance Men."

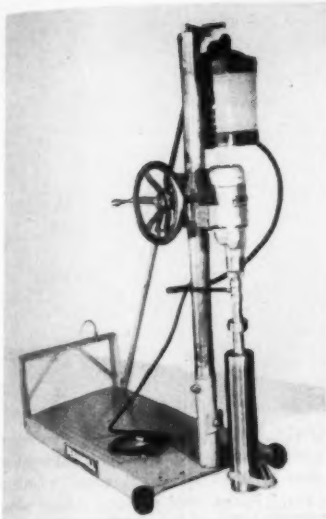
*Reg. U. S. Pat. Off.

For more facts, use coupon or circle No. 360

HELI-COIL CORPORATION
503 Shelter Rock Lane,
Danbury, Conn.

Please send Shop-pack Bulletin No. 724A.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____



The Pennndrill Model E.

Portable core drill for hard materials

■ A new light and portable electric drill that uses diamond bits for drilling holes in or extracting test cores from concrete structures, highways, or airport runways has been announced.

According to the manufacturer, the Pennndrill Model E drills clean, smooth holes $\frac{1}{2}$ to $6\frac{1}{2}$ inches in diameter, either vertically, horizontally, or at any angle. It drills through concrete walls and floors, reinforced concrete, marble, granite, tile, glass, and brick.

Drilling speed averages 1 to 3 inches per minute depending upon the degree of hardness of the material, and the amount of steel encountered.

For further information write to Pennsylvania Drilling Co., 1205 Charters Ave., Pittsburgh 20, Pa., or use the Request Card at page 18. Circle No. 151.

Wire connectors with seal suitable for field use

■ Waterproof and dustproof electrical wire connectors suitable for field use are shown in a leaflet from Rodale Mfg. Co., Inc., Emmaus, Pa.

The connectors feature a flexible rubber lip that overlaps the male cap to seal against dirt, dust, metal particles, and other foreign matter. The Flip Seal overlap also cushions the connection, protecting it from damage from shock or abuse.

Specifications for connectors listed in the leaflet range from 0.635 to 0.875 in cord hole size and include 2, 3, and 4-wire units with ratings of 10 to 20 amps.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 159.

Electric plants

■ A folder illustrates representative models in the Kohler Co.'s line of electric plants for sole supply, continuous heavy-duty service, and automatic stand-by protection. A chart details dimensions, weights, and other technical data.

To obtain this folder write to Kohler Co., Kohler, Wis., or use the Request Card at page 18. Circle No. 19.

For more facts, use coupon or circle No. 361→
MARCH, 1956

Booklet on pipe fittings

■ Engineering data and size information on Watson-Stillman forged stainless and alloy steel pipe fittings are listed in a new bulletin. The alloy covered include types 304, 316, and 304 L stainless steel; $1\frac{1}{4}$ per cent chromium to $\frac{1}{2}$ per cent molybdenum steel; $2\frac{1}{4}$ per cent chromium to 1 per cent molybdenum and 4 to 6 chrome $\frac{1}{2}$ per cent moly fittings. These forged stainless and alloy-steel fittings are designed for high temperature and corrosive applications and for high pressure-high temperature steam piping.

To obtain Bulletin S-1-55 write to W-S Fittings Division, H. K. Porter Co., Inc., P. O. Box 95, Roselle, N. J., or use the Request Card at page 18. Circle No. 160.

Platform hoist

■ The Hawkeye material-platform hoist that two men can erect in three hours is described in a bulletin. A diagram illustrates the many features of the hoist—a 5-hp motor, sturdy vertical monorail, safety locking device, platform limit switch, and electrical control box.

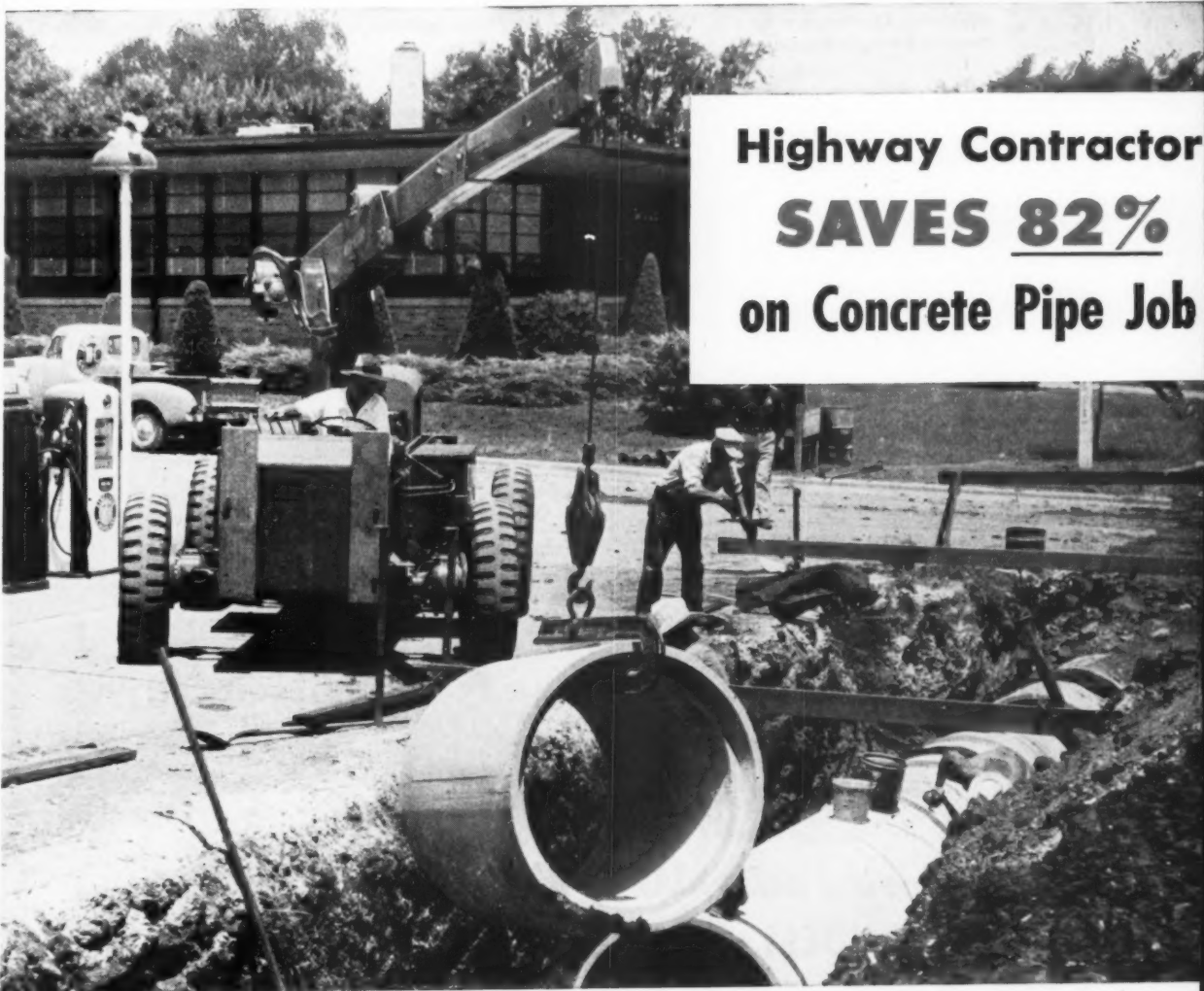
A step-by-step description of the

procedure for erecting the hoist is provided. According to the literature, the Hawkeye hoist can be raised to three stories or more.

To obtain this bulletin write to Hawkeye Engineering Co., Inc., 248 Lincoln Ave., Syracuse 4, N. Y., or use the Request Card at page 18. Circle No. 47.

Gar Wood representative

Bert Royce, now starting his 46th year with Gar Wood Industries, Inc., Wayne, Mich., will again represent Gar Wood-Buckeye in the South and Southwest.



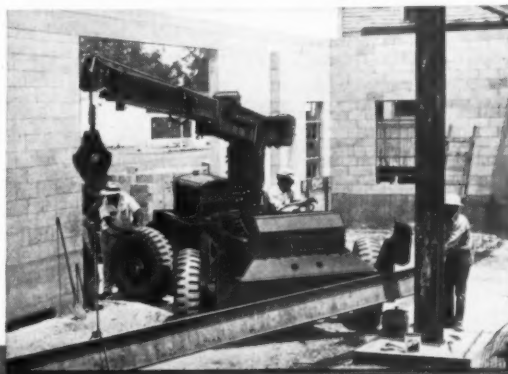
**Highway Contractor
SAVES 82%
on Concrete Pipe Job**

AUSTIN-WESTERN HYDRAULIC CRANE

Handles Work of 7 to 10 Men

R. S. Houge, Registered Professional Engineer, Springfield, Mo. says:

"Unique design permits use in locations where no other crane could operate."



"... Capable of 20 mph on the highway, this crane requires no loading and expensive transport."

"I never made a better purchase and at the end of six months paid off the balance."

"... This pioneer acceptance of the A-W Hydraulic Crane paid off to the tune of many thousands of dollars."

"No larger crane could have handled these loads beneath high tension wires of the overhead long distance transmission lines."

"... This was within practically one week's cost of returning 100% on our investment."

"We remember one particular day on which we laid 492 feet of 30-inch pipe in eight hours, after carrying approximately half of it a distance of from 300 to 500 feet."

"... It can easily handle 10,000-pound 66-inch four-foot sections of concrete pipe."

"Instead of three men installing one bracket a day, he himself installed six brackets each day at a cost of \$14 apiece, as against his \$80 bid."

"... We haven't spent a cent for repairs in its first 11 months use."

Get the complete story as reported by Mr. Houge to the H. P. Gould Company today.

Ask your dealer for a copy or mail the coupon below

AUSTIN-WESTERN WORKS

629 Farnsworth Avenue, Aurora, Illinois
Please send complete Gould Certified Report No. 5506.

Name.....

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Company.....

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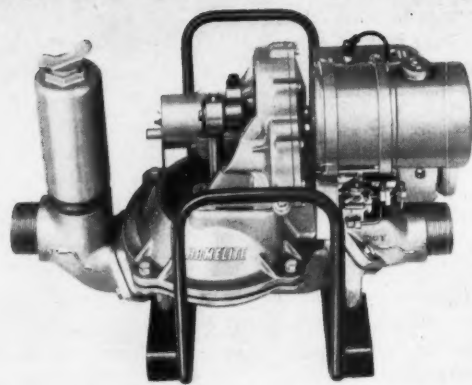
City..... Zone..... State.....

AUSTIN-WESTERN WORKS

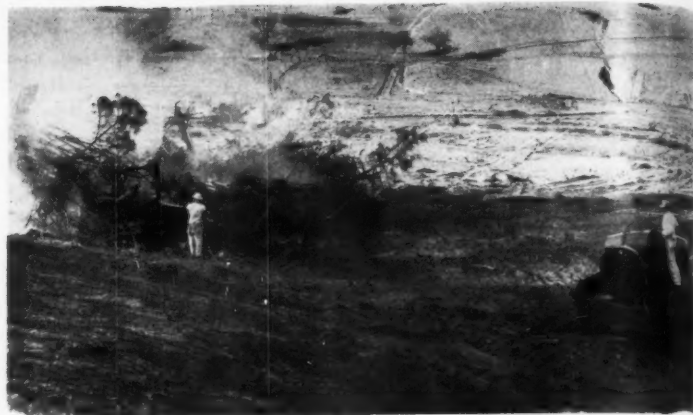
Construction Equipment Division • Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U. S. A.

Power Graders • Motor Sweepers
Road Rollers • Hydraulic Cranes



REPORTED TO RUN 6 HOURS at full capacity on one gallon of fuel, the Homelite Model 20DP3 diaphragm pump is rated at 5,000 gallons per hour. The new pump is designed to handle mud, muck, sand and sewage effectively. For details circle No. 174 on card at page 18, or write to Homelite Corp., Port Chester, N. Y.



ONE MAN WITH A TRIGGERED FLAME THROWER, circling this pile of green wood from newly cleared land, burns it quickly with the aid of the No. 75 Rotomist at right. Acting as a huge bellows, the Rotomist blows 20,000 cubic feet of air a minute as far as 125 feet. For details circle No. 175 on card at page 18, or write to John Bean Division, Food Machinery & Chemical Corp., San Jose, Calif.



ONE roller does compaction job of TWO!

when the one is a BUFFALO-SPRINGFIELD 3-AXLE TANDEM with exclusive "WALKING BEAM" compaction control!

On a recent Maine Turnpike project, one Buffalo-Springfield 3-axle tandem WALKING BEAM roller handled the pavement compaction instead of the two that otherwise would have been required.

Several sets of twin finishers laid 2,500 tons of hot mix each 11-hour day. The surface was put down in two 1½" thick courses over a 4" thick compacted stone base. Haul from hot mix plant to paving point was handled by a fleet of 15 trucks.

Without expert planning, traffic conditions would have been chaotic. An aggregate truck rolled up to the plant every 3 to 4 minutes, and asphalt trucks arrived and left almost as frequently.

A remarkable high-speed black-topping job . . . accomplished on a 'round-the-clock schedule by expert traffic management, several twin finisher set-ups, and using Buffalo-Springfield true WALKING BEAM

compaction to complete the job with maximum efficiency in the fewest number of passes.

Whether your next compaction job is a *special*, or one on which you must rely on maximum compaction accomplished in the shortest possible time—with fewest passes, and resulting highest profits for yourself—you'll be *sure* of unmatched results with a Buffalo-Springfield WALKING BEAM 3-axle tandem roller!

See your nearest Buffalo-Springfield distributor now. Ask or write for Bulletin No. S-71-1255.

Anything less than a genuine Buffalo-Springfield 3-Axle Tandem with WALKING-BEAM Compaction Control is old-fashioned!

BUFFALO
ROLLER COMPANY



SPRINGFIELD
SPRINGFIELD, OHIO, U. S. A.

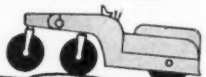
THE LEADER IN COMPACTION EQUIPMENT DESIGN AND MANUFACTURE



BEAM is in "semi-locked" position. Both guide rolls are suspended from a single pivoting beam. End guide roll can rise above, but not go below its normal position.



FIRST guide roll encounters high spot. Walking Beam permits it to pass over the hump exerting only its normal pressure. This "prepares" material for the high compaction of the center roll.



CENTER guide roll rises on hump. This lifts end guide roll off the ground and transfers its weight, along with some weight of the drive roll, to the center roll which now exerts a compaction effort equal to almost 3 times its normal weight.



DRIVE roll exerts normal compaction as it passes over. All this happens when the Walking Beam is in a "semi-locked" position. When unlocked, it follows surface contours. Fully locked, all three rolls are held rigidly in the same plane.

Spring-cushion tractor

■ A new bulletin describes a shock-cushioning feature of the International Drott Skid-Shovel for digging, grading, carrying, loading, and dumping. This is the Hydro-Spring, a hydraulic cylinder enclosed in a heavy-duty coil spring. Shock force displaces oil from the main lift cylinders into the Hydro-Spring cylinder. This extends or compresses the big spring to absorb and cushion impact.

The device is offered in four Skid-Shovel models ranging from 1 to 3 cubic yards.

To obtain Bulletin CR-403-F write to Drott Mfg. Co., 3841 Wisconsin Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 164

Excavator crane

■ A new bulletin describes the Bucyrus-Erie 15-B excavator-crane. This ½-yard shovel is readily convertible to dragline, clamshell, dragshovel, or

IF IT'S A

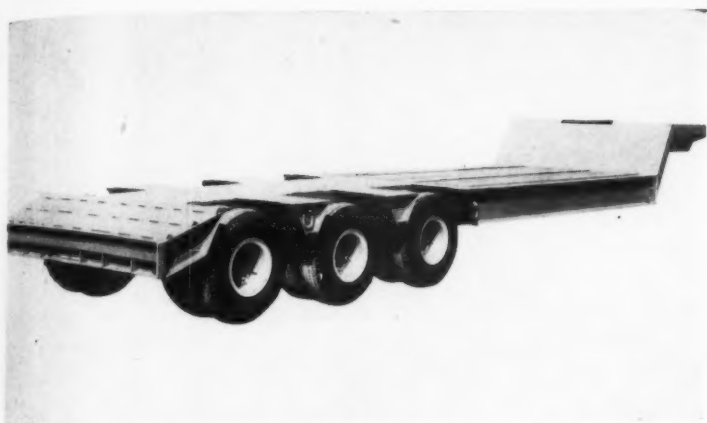
WET JOB

PLAY SAFE! ASK FOR A DEWATERING ANALYSIS BY

GRIFFIN
WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

For more facts, circle No. 363
CONTRACTORS AND ENGINEERS



SPECIFICATIONS ON THE MODEL GTX triple-axle low-bed trailers have been released by Transport Trailers, Inc. Available with 15 or 20-inch wheels and with integral or removable goosenecks, these trailers have capacities of 25 through 45 tons. For details circle No. 170 on card at page 18, or write to Transport Trailers, Inc., 1200-34 12th St. S. W., Cedar Rapids, Iowa.



THIS NEW 2¼-CUBIC-YARD "FOUR-IN-ONE" Skid-Shovel for the 75-hp International TD-14 tractor converts instantly from Skid-Shovel to bull-clam, clamshell, or bulldozer. These changes require only the flick of a small lever located within easy reach of the operator. For details circle No. 172 on card at page 18, or write to Drott Mfg. Co., 3841 W. Wisconsin Ave., Milwaukee, Wis.

lifting crane for handling a wide range of excavating and lifting jobs. It is offered with gasoline engine, diesel engine, or electric motor.

Other basic features described are: hand-set clutches; all-welded revolving frame; crawler mountings; positive, twin-rope crowd system; fully independent boom hoist; four-way safety control of boom lowering; and full-rotating dragline fairlead.

To obtain Bulletin 15-B-4 write to Bucyrus-Erie Co., South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 166.

Ferguson establishes division office in South

The H. K. Ferguson Co., engineers and builders of Cleveland, Ohio, has opened a division office in Atlanta, Ga., to handle the growing volume of work in the South. Located at 1528 Fulton National Bank Building, Atlanta, the new office will be headed by Cephas P. Quattlebaum.



NOVO Diaphragm Pumps
ARE available
For IMMEDIATE DELIVERY
Same low cost • Better Quality

Now under new management, and offering to NOVO's many thousands of satisfied customers and dealers, a more complete and guaranteed service program. Dealerships available in some areas. Get the facts... write today for full details.

- NOVO's proven "work horses" pull more water, sludge or mud.
- Longest service — lowest downtime
- 8 models — 4M to 16M G.P.H.

Dependable
Since
1908



NOVO
PUMP AND
ENGINE CO.
702 Porter Street Lansing, Michigan

For more facts, circle No. 364

MARCH, 1956

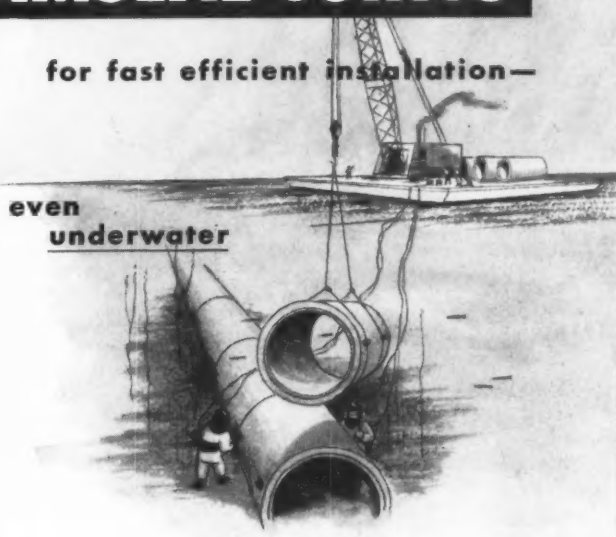
LONG LENGTH concrete pipe with

RUBBER and STEEL

AMSEAL JOINTS

for fast efficient installation—

even
underwater



Whether underwater or not, long lengths speed installation by reducing handling and joint-making and results in lower initial costs. The reduced number of joints and the improved flow capacity also mean savings in operation and maintenance.

The "pressure proven" rubber and steel AMSEAL joint provides a flexible but positive water-tight seal against costly infiltration or leakage. For underwater work, subaqueous connections are provided to simplify installation.

Take advantage of long length concrete pipe with AMSEAL joints for projects involving water intakes, sewage outfalls, inverted siphons, intercepting sewers, and low pressure sewer and water mains.

Our technical staff will be pleased to assist you with your pipe problems.

AMERICAN-MARIETTA COMPANY CONCRETE PRODUCTS DIVISION

GENERAL OFFICES:
AMERICAN-MARIETTA BUILDING,
101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS PHONE: WHITEHALL 4-5600

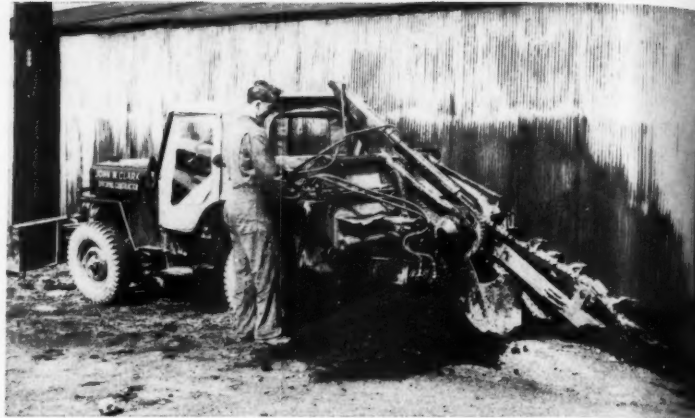
DIVISIONS AND SUBSIDIARIES

B. C. Concrete Company, Ltd. Concrete Products Co. of America Lewistown Pipe Company
Concrete Conduit Company Lamar Pipe and Tile Company Universal Concrete Pipe Co.
Tellyer Concrete Pipe Co. American-Marietta Company of Pennsylvania

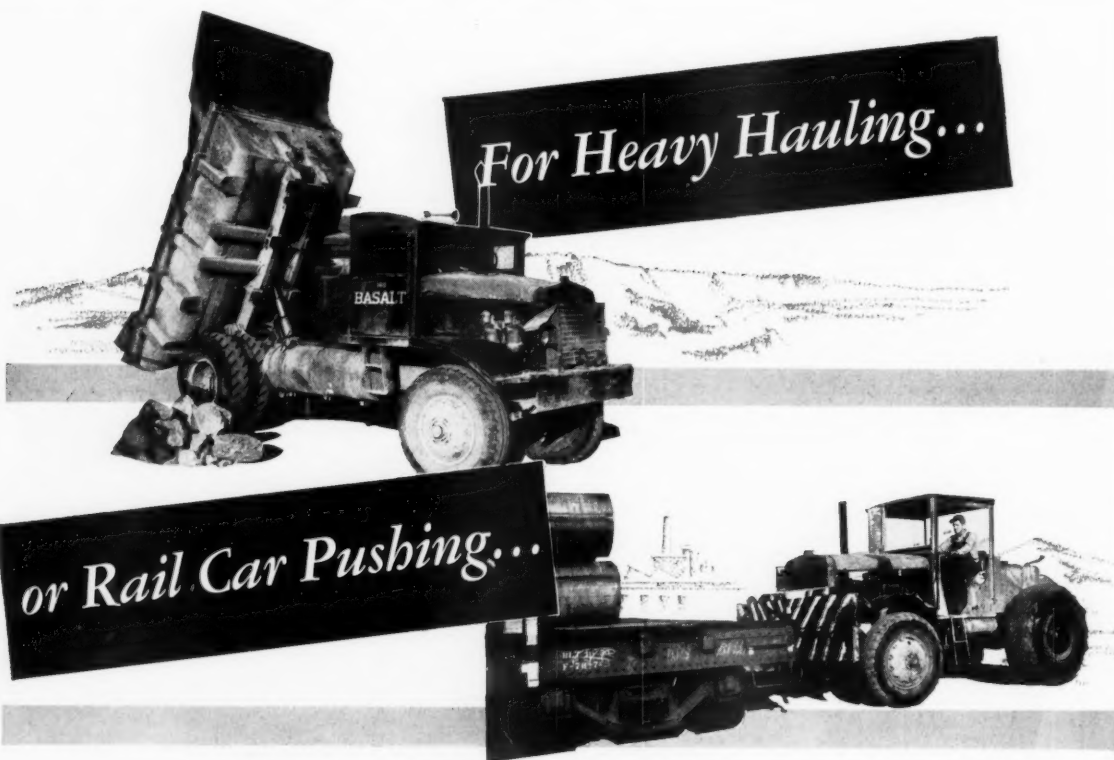
For more facts, use Reader-Reply Card opposite page 18 and circle No. 365



THIS NEW DTA CONCRETE-CUTTING MACHINE is designed for heavy-duty joint cutting, trenching, and patching jobs. Non-sway ball-bearing wheels, twin 14-inch blade guides, and handy dashboard controls are features. For details circle No. 169 on card at page 18, or write to Diamond Tool Associates, P. O. Box 85, 940 E. El Segundo Blvd., Hawthorne, Calif.



MOUNTED ON THE 4-WHEEL-DRIVE JEEP, the hydraulic Go-For-Digger trenches 400 to 500 feet per hour 3 feet deep in loam or clay. Its capacity ranges between 6 to 16 inches wide and 5 feet deep. The cutting chain slides on tubes to work close to walls on either side. For details circle No. 173 on the card at page 18, or write to A. J. Parsons, 80 W. Maiden St., Washington, Pa.



Fuller Transmissions handle the hard jobs easily for Basalt Rock!

Twenty Euclid dumps and two tractors converted into "car pushers" . . . ALL Fuller Transmission equipped . . . handle tons of the heaviest work around Basalt Rock Company, Napa, California.

Twelve rear dumps and the two pushers are equipped with Fuller 5-A-920 5-speed Transmissions, and the eight Model 9FDT bottom dumps with Fuller 4-B-86 4-speed Transmissions.

In both these applications Fuller Transmissions deliver the horsepower

faster. Right gear ratios, short, easier shifts, result in faster work cycles. Heavy rock and gravel hauls for the dumps . . . industrial locomotive loads for the "pushers"—these are the daily jobs that Fuller Transmission equipped units are doing efficiently at the main Napa plant, the Heraldsburg gravel plant, and in the McNear Stone Quarry on San Pablo Bay.

The company started building this fleet of Euclids with Fuller Transmissions in 1938 . . . made additions in 1944, '45 and '46.

ALL ARE GIVING EXCELLENT SERVICE IN 1956—DELIVERING MORE WORK TIME WITH MINIMUM DOWN TIME!

Select YOUR transmissions from Fuller's 110 models—both semi-automatic and full manual control. You'll find the transmission designed to do YOUR job . . . better . . . at less cost.

where horsepower ^{really} goes to work



FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla. For more facts, use Reader-Reply Card opposite page 18 and circle No. 366

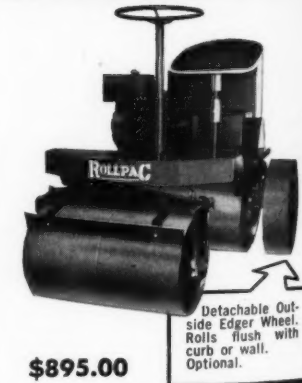
Oil-heater folder

The entire electrical system of the Bros oil heater unit is now weather-proofed, as well as the electrical control box, according to a brochure from the company. Bros Hi-Heat oil heaters are recommended for use with asphalt plants and other allied equipment, or where heating temperatures of 500 degrees F are required. The specifications chart lists the Btu rating of three units from 1,400,000 to 2,800,000. The heaters can be permanently or temporarily installed.

To obtain this literature write to Wm. Bros Boiler & Mfg. Co., 1067 Tenth Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 85.

Aluminum ladders

Literature from Newark Ladder & Bracket Co. features its line of aluminum extension ladders. There is also a complete listing of other products available from this company, in-



\$895.00

A Standout Popular-Priced One Ton Roller. Send for Catalog.

ROLCOR Industries
1208 2nd Ave. So. Minneapolis 3, Minn.
Sold by over 95 distributors in United States and Canada

For more facts, circle No. 367
CONTRACTORS AND ENGINEERS



TECTUM, A WOOD-FIBER BUILDING MATERIAL, helped give Lafayette, Indiana, a new 8-room school in near record time—21 working days after the foundation was laid. The roof decking also serves as an insulating, sound-deadening exposed ceiling for the prefabricated structure. For details circle No. 176 on card at page 18, or write to **Tectum Division**, 105 S. 6th St., Newark, Ohio.



HOBBS SCHONROCK 15-YARD CABLE-DUMP TRAILERS were used effectively to haul jumbo-size rocks 40 miles to the site of the Tiber Dam near Chester, Mont. To dump, the trailers use a winch that pulls a cable through a sheave to draw the trailer wheels to the tractor. For details circle 171 on card at page 18, or write to **Hobbs Mfg. Co.**, Division of Fruehauf Trailer Co., 609 N. Main St., Fort Worth, Tex.

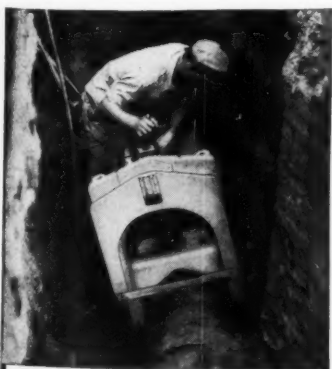
cluding steel scaffolds, space heaters, and salamanders. Pictures of more than 100 pieces of equipment are illustrated.

To obtain this literature write to Newark Ladder & Bracket Co., Inc., Walnut and Cenral Aves., Clark Township, N. J., or use the Request Card at page 18. Circle No. 43.

Self-welding unit

■ The Lincwelder 100, a small welding machine for contractors' maintenance work, is announced in a new folder. It is claimed that the unit is simple enough for an amateur to use. The single-phase 60-cycle unit operates on 115/230 volts. Weighing only 84 pounds, the welder is 12×9×14 inches, according to the specifications table. Optional equipment includes an arc torch for soldering and brazing.

To obtain this folder write to The Lincoln Electric Co., P. O. Box 5758, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 92.



BIG GUILLOTINE

THE NEW WACHS
POWER PIPE SAW

No Flame—Safe Cuts Under
Hazardous Conditions!

FASTER—SAFER—ACCURATE!

Cuts 10", 12", 14" & 16"

Cast Iron and Steel Pipe

WACHS BIG GUILLOTINE SAW FACTS—

- Cuts Fast
- Cuts Clean
- Cuts Square
- Set up time, several minutes
- Power—electric or air motor
- Weight 312 pounds
- Height 31"
- Width 31½"
- Depth 14½"

Power Pipe Cutters from 2 inch to 6 Foot Capacity

For further information write to:
THE E. H. WACHS COMPANY
1525 N. Dayton Street • Chicago 22, Illinois

For more facts, circle No. 450

MARCH, 1956

For the Toughest Jobs...



General All-Duty L. C. M.



General L. C. M.

**THE
GENERAL
TRUCK TIRE**

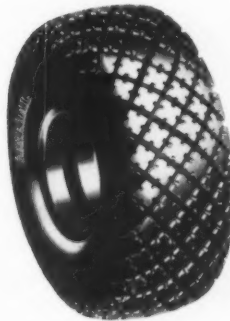
**FEATURING
STRONGER-
THAN-STEEL
NYGEN®
CORD**

**BUILDS THE TOUGHEST TIRE
LINE-UP EVER PRODUCED!**

Unexcelled for strength with *exclusive* Nygen Cord, and for ideal crawler-like traction and flotation, The General Tire makes every off-the-road job show a profit. Built big, broad and rugged, they provide utmost protection against job hazards... keep units consistently on the move to get jobs done faster.



General D. T. L.



General Earthmover



General Tractor Grader

THE GENERAL TIRE & RUBBER COMPANY • Akron, Ohio
SPECIFY GENERALS ON YOUR NEW EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 368

Avoid legal pitfalls

Mechanics' liens on separate housing units

THE PROBLEM: In Connecticut, as in other states, the mechanics' lien law permits liens against "any building or its appurtenance". A single lien claim was filed against a housing development consisting of 91 single-family dwellings each one on its own lot. Sixty had been sold, and each was treated as a separate unit for mortgage purposes. A single lien claim attempted to cover the entire develop-

ment for materials and engineering services furnished in the construction of the houses. Did a valid lien result?

THE ANSWER: No. (In the Matter of Glen Haven Estates, Inc., Bankrupt, 123 Fed. Supp. 659, decided by the United States District Court, District of Connecticut, Bankruptcy Division.)

The court said that under the "lienable unit" test, regard must be had for the physical relationship of the buildings and land to determine whether or not they should be treated as a unit, regardless of overlapping furnishing of services and materials. The court cited illustrative cases, including one where several detached farm buildings were treated as a lienable unit for lien purposes.

Cement measurement

THE PROBLEM: Cement was delivered to a dam site in 1,157 cars. Claiming a shortage in quantities delivered, the buying contractor sued for a refund, but a question of how the deliveries should have been measured was presented. Since the contract did not specify how the cement was to have been measured, the seller relied on its custom of weighing each load on track scales at its plant, subtracting the rated car weight, and converting the net weight into barrel measurements for invoice purposes. The cars were not reweighed at the delivery point, but the account of the weight of cement converted into barrels showed a shortage of 6,308 barrels.

rels. Was the buyer entitled to a refund on the theory that there was a shortage of 6,308 barrels?

THE ANSWER: Yes. (General Portland Cement Co. v. L. P. Reed, Inc., 221 Fed. 2d 317, decided by the United States Court of Appeals, Fifth Circuit.)

In upholding a judgment in favor of the buyer that had been rendered by the United States District Court for the Western District of Texas, the Court of Appeals was influenced by testimony tending to show that the shortage was due to heavy deposits of caked cement on the tops of some of the cars used in deliveries.

Statutory notice of claim must be given by supplier

THE PROBLEM: Under Illinois law, could one who furnished materials for village water-works construction enforce a claim against the contractor's performance bond without showing that statutory notice of the claim had been given to the village?

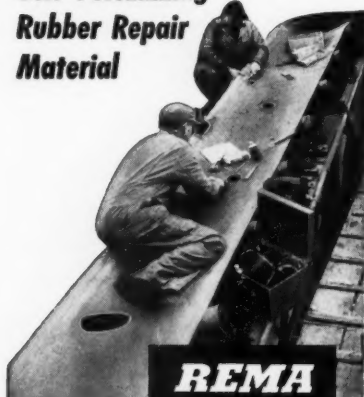
THE ANSWER: No. (McWane Cast Iron Pipe Co. v. Aetna Casualty & Surety Co., 122 N. E. 2d 435, decided by the Illinois Appellate Court, Third District.)

Interest on damages runs from judgement date

THE PROBLEM: Ordinarily, interest is not allowed on an unliquidated claim prior to the date of judgement. In Kansas, however, and in federal cases, interest may be allowed before judgement even on an unliquidated claim where the debtor has unreasonably and unjustly delayed an adjustment or suit. Where the debtor acts in good faith and the amount due cannot be ascertained before judgement, interest runs from the judgement date. A subcontractor sued for \$72,000, which he claimed to be the

Use REMA to add years of life to your Belts

REMA is the New and Amazing Self-Vulcanizing Rubber Repair Material



REMA

REQUIRES

- NO HEAT
- NO HEAVY EQUIPMENT
- NO CURING TIME DELAY

• REMA is not just another cold patch. REMA is vulcanization by chemical process. The repaired area is sealed with an abrasive resistant cover stock patch. No heat or heavy vulcanizing equipment required. Here's the astonishing advantage—when repair work is completed belts may be returned to service immediately.

• REMA seals out moisture, reduces mildew, rot and deterioration—the great enemies of conveyor belts. Your own maintenance man can quickly repair your belt—it doesn't take a skilled belt mechanic to use REMA.

• Used for repair of all types of damaged spots, edge wear and for covering metallic joints. Available in introductory kits or parts separately.

Order from your Flexco-Alligator distributor
Write for Folder No. R4

FLEXIBLE STEEL LACING CO.
4608 Lexington St., Chicago 44, Ill.

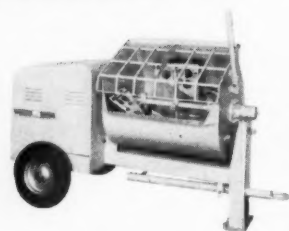
REMA SELF-VULCANIZING

RUBBER REPAIR MATERIALS

For more facts, circle No. 369

WESTERN

MIXERS and POWER ROLLERS ARE LEADERS IN THEIR FIELDS offers HIGH PROFIT PRODUCTION with MINIMUM INVESTMENT

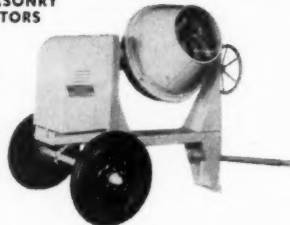


Concrete Mixers—3½ cu. ft. capacity, tilting type with either side discharge or end discharge. Extra large drum size with fast, thorough mixing action, Timken bearings throughout, powered with Briggs and Stratton engine or electric motor.

Western has achieved universal praise for the best mixer for mortar, plaster and terrazzo. Its prices are among the lowest in the industry without any sacrifice in quality. This was accomplished by thorough design and excellent workmanship.

Plaster and mortar mixers are made in 4, 6, and 8 cubic foot sizes with Briggs and Stratton engines or electric motors. All gasoline driven machines have power throw-outs with starting switches on all electric units. A special shaft seal protects bearings. Rubber blades are standard on all models.

WESTERN MACHINES PRODUCE PROFITS FOR MASONRY CONTRACTORS



Power Rollers—3 sizes, 1, 1½, and 2-ton models with compression up to 91 lbs. complete with self-adjusting scrapers, cocoa mats, watering system, multiple disc, clutch with forward and reverse, single lever control designed to roll within ¾" of wall, Briggs and Stratton engine.

WESTERN WELDING and MFG. CO.
2025 W. Clybourn St. Milwaukee, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 370

DUAL PRIMERS

Faster Dual Priming . . . More Dependable Operation
Longer Life . . . Less Maintenance

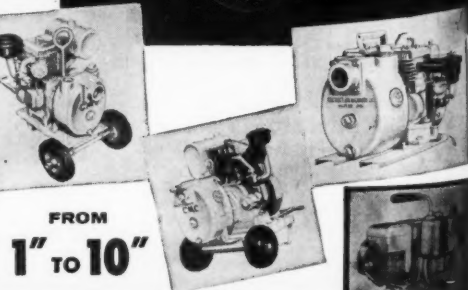
KING SIZE PUMP VALUES

that spell lower cost water handling on any construction job



LOOK AT THESE MONEY-SAVING FEATURES

- Dual Volutes
- Self Cleaning Case
- Lighter Weight
- Long Life Seal
- Half the Parts
- Unitized Construction



FROM
1" TO 10"

CONSTRUCTION MACHINERY COMPANY • Waterloo, Iowa

For more facts, use Reader-Reply Card opposite page 18 and circle No. 371

CONTRACTORS AND ENGINEERS

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value of work performed before he was allegedly discharged. He won judgment for less than one-fifth on sharply conflicting evidence as to the amount fairly due to him. The trial had not been delayed vexatiously. Did the trial judge err in allowing interest from the date of the subcontractor's discharge?

THE ANSWER: Yes. (Southern Painting Co. v. United States, 222 Fed. 2nd 431, decided by the United States Court of Appeals, Tenth Circuit.)

The Court of Appeals, in reversing a decision by a United States district judge in Kansas, decided that interest should run from the date of judgment.

Proper progress payments

THE PROBLEM: Public-school building contracts provided for progress payments, on certificates of the supervising architect, covering "labor and materials complete and/or stored on the job site." (1) Was it improper that the contractor, rather than his surety, was allowed, as part of the first progress payment, the full amount of paid insurance and bond premiums, considering that actual construction had not begun at one site and only some foundation trenches had been excavated at the other? (2) Did the progress payments improperly cover temporary and portable structures for storage of the contractors tools and materials?

THE ANSWER: (1) Yes. (2) Yes. (Pan America Surety Co. v. Board of Public Instruction, Okaloosa County, Fla., 76 So. 2d 868, decided by the Florida Supreme Court.)

The court noted that no insurance and bond premiums had been earned.

Regarding the provision for progress payments against "materials complete and/or stored on the job site", the court said that coverage

was limited to articles that were necessarily consumed in the work and lost their identity in the finished product. Otherwise, they were classified, not as materials, but as part of the instruments, tools, and equipment of the contractor.

Defect in carport floor

THE PROBLEM: A carport floor next to a house was defectively constructed because it slanted toward the house. The owner enclosed the carport to prevent water from settling. Could he complain because the floor was not pitched away from the house?

THE ANSWER: No. (Picou v. McKinney Construction Co., 79 So. 2d 412, decided by the Louisiana Court of Appeals, New Orleans.)

Oral agreement to pay for extra work is valid

THE PROBLEM: The parties to a land-leveling contract assumed that cuts and fills would balance, but while work proceeded it was discovered that a considerable amount of borrow would be required. Was an oral promise by the owner to pay a specified yardage rate for borrowed dirt binding?

THE ANSWER: Yes. (Evergreen Amusement Corp. v. Milstead, 112 Atl. 2d 901, decided by the Maryland Court of Appeals.)

The court said that making of the oral agreement was circumstantially shown by records kept by the owner of the quantity of borrow used and by approval of bills covering it.

Edited by A. L. H. STREET Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Private business records as evidence in courts

THE PROBLEM: Statutes in force throughout the country provide that properly proved, properly kept books of account and other business records may be used as evidence to establish the fact of delivery of goods or materials, etc., on certain dates and at

ANNOUNCING THE NEW SHAWNEE "SCOUT" BACKHOE MODEL D70HL

SHAWNEE OFFERS MORE FEATURES FOR LESS MONEY

Exclusive, patented drag line principle produces digging force of approximately 6,000 lbs. at bucket teeth.
Patent Numbers: 2,669,367 and 2,682,346

6-bank, free-flowing valve system—can operate 2 or more at once.

Bucket widths—12" to 24" inclusive. Flat bottom buckets 32" and 36"

DIGS 12 FT. DEEP — LOADS 8½ FT. HIGH

FOR ALL POPULAR MAKE TRACTORS

NEW INDIVIDUALLY CONTROLLED HYDRAULIC STABILIZERS

Now designed with hydraulic "feet" for quick leveling-up to dig plumb holes, new D-70-HL is ready for work seconds after the tractor stops rolling. Working on slopes or with one wheel on a curbing makes no difference. Recommended for mounting with the Shawnee "Special" front end loader.

SHAWNEE "SPECIAL" LOADER

Frame slides into permanently mounted "U" bracket.

Chromium-Plated rods, polished cases. (Double acting).

Welded Box Frame

Bucket roll back, down pressure, 2,000 lb. lift

To remove loader, remove frame pins, hoist loader forward and up, then drive tractor away. Takes less than five minutes.

Single or twin bucket cylinders optional.

Perfect team-mate for the new D-70-HL, the "Special" Loader provides a balanced unit regardless of which tool is being used. It has tremendous lifting power—dumps well ahead of the front of the tractor and has powerful down pressure to bite into tough materials.

ATTACHMENTS FOR USE ON ALL SHAWNEE LOADERS

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- CRANE HOOK
- STREET BROOM
- FORK LIFT
- BULLDOZER
- SNOW BUCKET

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COMPARE THE FEATURES OF WACO with those of three other nationally-known brands of scaffolding.

You'll find waco is the only scaffolding offering all these features as standard equipment at no extra cost. You'll find as thousands of other quality-minded contractors have found that WACO all-steel sectional scaffolding is recommended without reservation. Their unqualified acceptance of this safe, cost-cutting scaffolding is another proof of WACO's leadership in the scaffolding field.

Let this table tell you the plain truth about WACO Scaffolding. Let it tell you why WACO is your soundest scaffolding investment.

	WACO	BRAND A	BRAND B	BRAND C
Automatic fasteners as a part of all standard frames.	Yes	No	No	Yes
Floating type coupling pins for easy erection.	Yes	No	No	No
Built-in coupling pins on all frames.	Yes	No	No	Yes
All standard frames high carbon steel with built-in ladders.	Yes	No	No	No
Brace locks on the inside of frames.	Yes	Yes	Yes	No
High carbon steel pivoted cross braces.	Yes	Yes	Yes	No
Only one style bracket needed.	Yes	No	No	No
Number of parts for standard 5' x 7' section.	4	16	16	6

WACO SALES RENTAL ESTIMATES

WACO MANUFACTURING COMPANY
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Minneapolis 16, Minnesota

LICENSEES

Armson Iron Works
Ontario, Canada

Waco-May Co.
Los Angeles, Calif.

For more facts, circle No. 451

Do A Better Job FASTER with the NEW Prewitt HORIZONTAL DIGGER

Designed For Laying Mains and Underground Line

- Drills Through Embankments
- Drills Under Highways and Sidewalks

Prewitt's new HORIZONTAL DIGGER gives low-cost, high-speed performance for all horizontal drilling up to 48 feet in all types of soil. Rugged, maneuverable, it mounts easily on skids... requires small operating space.

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SINCE 1929
Dept. 202, Pleasant Hill, Mo.

For more fact, circle No. 372
MARCH, 1956

For more facts, circle No. 373

avoid legal pitfalls

certain prices. This evidence is subject to contradiction by one sued on an account, but it is recognized as often being the only means whereby quantities, prices, etc., can be proved. (Of course, delivery receipts signed by a buyer are stronger evidence of the facts shown by them.) In a suit on behalf of a millwork subcontractor against a government contractor to collect a balance due, the latter counterclaimed for the cost of reworking allegedly defective millwork. Could the counterclaim be supported by showing that the general contractor had sent a "Back Charge" notice

to the subcontractor, itemizing charges for reworking various millwork items?

THE ANSWER: No. (United States v. A. J. Rife Construction Co., 224 Fed. 2d 600, decided by the United States Court of Appeals, Fifth Circuit.)

The counterclaim could not be proved by a self-serving document which, in effect, was a statement of the counterclaim itself.

Depth of highways

THE PROBLEM: A water company had long maintained a pipeline under a highway. Did this make it unnecessary for the company to relocate the line when the grade was lowered to

improve the road for public travel?

THE ANSWER: No. (Anderson v. Stuarts Draft Water Co., 87 S. E. 2d 756, decided by the Virginia Supreme Court of Appeals.)

The court showed that these rules of law are generally recognized:

(1) An easement for a highway is not limited to the mere surface, "but extends both upward and downward for a distance sufficient to accommodate, as well as protect, all proper uses to which the way is subject".

(2) Whatever rights the owner of the soil below the highway may have to license its use by others are subject to the public right to make any change in the highway that tends to make it more useful for public travel.

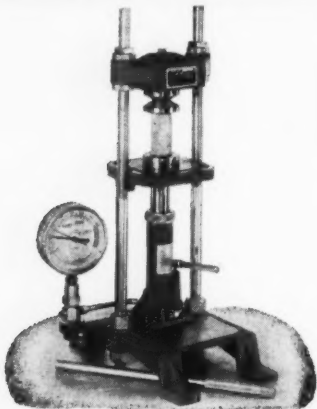
No duty to pay when city contract is void

THE PROBLEM: An engineering company could not collect the pay agreed upon for services to a city on a municipal utility-extension project. The amount had been decided under an agreement that had not been approved by the city council, although it had been signed by the mayor and board of public works. Could the company compel payment of the reasonable value of the services, since it had innocently supposed that its contract was valid and enforceable?

THE ANSWER: No. (Laramore & Douglass, Inc., v. City of Anderson, Ind., 222 Fed. 2d 480, decided by the United States Court of Appeals, Seventh Circuit.)

The court said: "If recovery is to be allowed on an implied contract against municipalities despite clear statutory restrictions upon the powers of its officers or boards to incur liabilities, then the protection of the statutory restrictions would, in a large measure, be swept away."

Cut Road Building Costs with SOIL AND BASE MATERIAL TESTS... on the CARVER LABORATORY PRESS



Numerous soil tests necessary prior to road building or other construction can be quickly and easily accomplished on the portable, hand-operated, self-contained CARVER LABORATORY PRESS. Moisture content, compaction, shear and other soil or base material characteristics are readily determined with this on-the-spot equipment.

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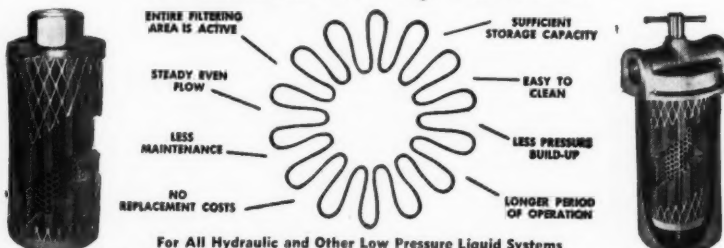
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144

When You Need A Filter—Get The Advantages of Marvels SYNCLINAL Design It's BALANCED for Top Performance



For All Hydraulic and Other Low Pressure Liquid Systems
In the selection of a filter to obtain maximum efficiency and quality, the most important to consider is a specific type filter that will offer greatest ACTIVE filtering area with ample storage capacity for filtered out particles, rather than total filtering area alone. Over 650 Original Equipment Manufacturers install Marvel Synclinal Filters as Standard Equipment because they are designed to give this all-important balance in filtration of liquids in all hydraulic and other low pressure circulating systems. Flow of liquids is maintained at a constant, steady rate of speed produced by the pump which brings about the desired effect of a gentle, evenly distributed accumulation of filtered out particles against the entire filtering surface with less restriction of flow. Result—longer periods of production operation at minimum maintenance down-time.

EASY MAINTENANCE

Both sump and line type filters may be easily disassembled by any workman in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

FILTERS FOR FIRE-RESISTANT HYDRAULIC FLUIDS
Marvel's most recent development is a filter for the efficient filtration of all types of fire-resistant hydraulic fluid.

WATER FILTERS

Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced synclinal design.

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Chicago, Ill. March 19 thru 23, 1956

Without obligation, please send me complete data on Marvel Synclinal Filters, as indicated:
☐ Catalog #107—For Hydraulic Oils, Coolants and Lubricants
☐ Catalog #301—For WATER
☐ Catalog #200—For Fire-resistant hydraulic fluids.
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Company
Address
City State

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POWER CARTS

CONCRETE-CARTS

WHEELBARROWS

GAR-BRO

Selection Chart

Equipment	Load Capacity	Maximum Travel Distance	Speed	Capacity* Per Hour
POWER-CARTS	9 to 12 cu. ft.	1000 ft.	15 mpr.	15 to 20 cu. yds.
CONCRETE-CARTS	6 to 8 cu. ft.	200 ft.	walking	3 to 5 cu. yds.
WHEELBARROWS	3 to 5 cu. ft.	200 ft.	walking	1 to 1½ cu. yds.

*according to hauling distance

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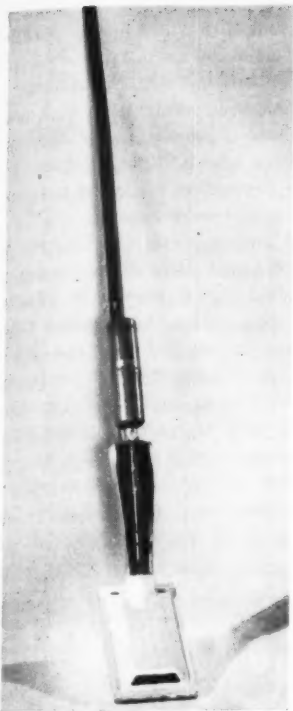
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 376

CONTRACTORS AND ENGINEERS



Camm's self-heating iron

Self-heating asphalt iron uses liquid petroleum gas

A self-heating asphalt iron operating on one tank of liquid petroleum gas that will last from 4 to 5 hours has been placed on the market by Camm Mfg. A feature of the new unit is that the burner has been designed without the curves and elbows of previous models. Also, the usual pressurizing pump has been eliminated in this model.

The shoe heats to over 650 degrees in ten minutes less than other irons, the manufacturer claims.

For further information write to Camm Mfg., 1425 First St., San Fernando, Calif., or use the Request Card that is bound in at page 18. Circle No. 34.

Portable compressors

Portable air compressors for trench digging, waterproof and paint spraying, demolition work, concrete chipping, and rock drilling are featured in a mailing piece from P. K. Lindsay Co. Job photos show one and two-man crews operating models that have 15, 55, and 80 cfm rating.

To obtain this mailing piece write to P. K. Lindsay Co., 97 Tilestone St., Everett 49, Mass., or use the Request Card at page 18. Circle No. 82.

Lubrication manual

Sinclair Refining Co. has released a manual on the correct lubricant to use for a wide variety of roadbuilding and construction machinery. Included is a complete listing of Sinclair lubricants and greases used by the construction industry. The remainder of the manual is devoted to an alphabetical listing of construction machinery, with recommendations on the best type of lubricant offered for each.

To obtain this manual write to Sinclair Refining Co., 600 Fifth Ave., New York 20, N. Y., or use the Request Card at page 18. Circle No. 46.

MARCH, 1956

Turbocharged tractor-shovel

The Michigan Model 180 Turbo-Dozer, featuring power-shift transmission, heavy-duty torque converter, and 2 $\frac{3}{4}$ -cubic-yard capacity bowl, is highlighted in a new catalog. Action shots show the operational qualities of this rubber-tire dozer powered by a turbocharged 165-hp diesel engine. Side and overhead drawings, along with engine, power train, and hydraulic system specifications are given.

To obtain Bulletin 157 write to Clark Equipment Co., Construction Machinery Division, P. O. Box 599, Benton Harbor, Mich., or use the Request Card at page 18. Circle No. 96.



"Just a final question—what's your blood type?"

Labor and Time Savings on the Job!

HANDLE MANY JOBS WITH THESE ATTACHMENTS



Strike-off Box Attachment. For road widening fill and asphalt paving. Adjustable on three sides to 6" above grade. Strike-off blade extends 4'. Remove with one pin.



Conveyor Extension Attachment permits backfilling 24" high curb or placing material over 7' from wheels. Take-off drive. Unit is 4' long with independent belt.

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POWER-PACK BACKFILLER

Performance proved! Everywhere POWER-PACK has been used great savings result in labor and time... also you can expect a better fill with no material wasted!

Only one man operating the POWER-PACK can power-backfill curbing, trenches, and pipelines at the rate of three tons per minute! This equipment has actually paid for itself on a single job.

Ruggedly built for long service. Easily portable with four swivel wheels and a sure, quick hitch. Can be used with any size dump truck including trailer dumps. Dependable 8.25 Wisconsin engine. Heavy duty belt.

To save time and money investigate POWER-PACK today! Write for booklet or phone your distributor.

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The 2¼-yard bucket of the Caterpillar No. 977 Traxcavator, capable of a 40-degree tip-back at ground level, picks up a full load in one pass without declutching. The higher seat gives the operator a better view of his work.

Big 2¼-yard model joins tractor-loader line

All the up-to-date features of the Caterpillar No. 933 and No. 955 Traxcavators have been included in the 2¼-yard No. 977—the newest and largest Traxcavator yet made by Caterpillar Tractor Co., Peoria, Ill.

Over-all dimensions of this 100-hp machine are: length, 17 feet ½ inch; width, 8 feet; height 7 feet 3¾-inches. It has a ground clearance of 1 foot 4½ inches. Forward speeds range up to 651 feet per minute and reverse



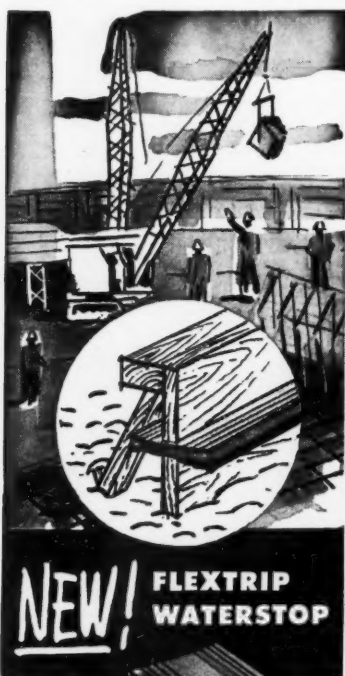
speeds up to 616 feet per minute.

Like the other two units in the Traxcavator line, the No. 977 is reported to have a good horsepower-to-weight ratio, an advanced hydraulic system, and good balance and stability. The equipment's large lifting capacity and fast response to control make it efficient at work, while in-seat starting and improved visibility make operation of the Traxcavator more convenient for the operator.

One of the biggest features of the No. 977 is the differential lever on each of the lift arms, which makes possible a 40-degree tip-back of the bucket at ground level. This allows the bucket to hold heaped loads even

in loose material. The bucket can drive into a stockpile and tip back with a full load in one pass, without declutching. Or, as the tractor gives a horizontal push, the bucket can be alternately tipped and leveled to work its way into harder material.

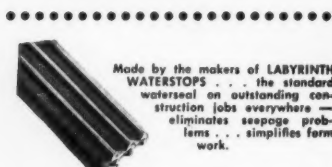
Loading-cycle time has been lowered by this feature, as well as by the automatic bucket positioner on the bucket tip valve. This allows the operator to move the lever into the tip-back position and release it so that he is free to work gear shift and steering controls. The lever will automatically move to "hold" when the bucket reaches the digging position. This automatic positioner is adjustable to



THE LATEST VINYL PLASTIC WATERSTOP

for "wall-floor" and "between-pour" horizontal concrete construction joints

Water just can't get through joints protected by FLEXTRIP, the all-new, strip-type waterstop. Unique concave shape plus ribbed edges give FLEXTRIP a never ending grip in the concrete... is flexible enough to withstand extreme joint-separation (more than 3 inches) yet rigid enough to stand up to the battering effect of pouring concrete. Here's lasting joint-protection unmatched by any other waterstop. What's more, FLEXTRIP will never rust, rot, check or crack and is unaffected by acid, alkalis, petroleum products, chemicals or the most adverse atmospheric conditions... lasts as long as the concrete. Write for additional information on FLEXTRIP and other vinyl waterstops. Send coupon below.



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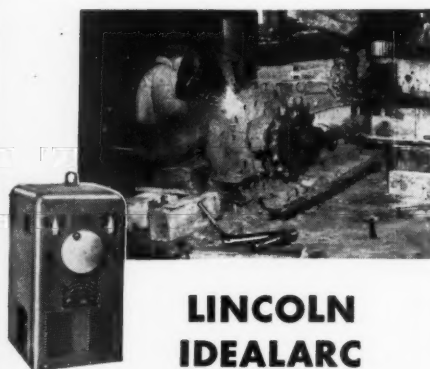
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Handles every type of electrode...

Yet costs less to buy and operate...

WHY shouldn't you be using IDEALARC for all your maintenance welding



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Certain electrodes work best on AC...others operate better on DC. Some rods that work best on DC in the smaller sizes work best on AC in the larger sizes. With still other rods, the opposite is true. IDEALARC, with its instant selection of AC or DC, gives optimum performance on every type and size of electrode.

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any digging angle. An automatic kickout is provided on the lift valve.

The bucket itself has good cleaning characteristics. The spill plate, of double thickness, extends high up for spillage protection. The replaceable cutting edge is of hardened steel, and the flat bottom section of the bucket makes for easy loading.

All controls on the No. 977 are within easy reach of the operator, including diesel engine or gasoline-starting engine. An exclusive Caterpillar feature found on the No. 977 is an oil-type flywheel clutch that seldom needs adjustment, has a long life, and decreases flywheel clutch lever pull.

For further information write to the company, or use the Request Card at page 18. Circle No. 78.

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Pick any lifting job... you'll find there's a Joyce Jack that will fill the bill! For Joyce builds a complete line of ratchet, screw, hydraulic, air operated jacks, trench braces and material lifting equipment... to meet every lifting application. And you can depend on Joyce Jacks too... for Joyce top-quality products have been the by-word for lifting equipment since 1873!

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IN CANADA: Midland Foundry & Machine Co., Ltd., Midland, Ontario

THE JOYCE-CRIDLAND CO.
DAYTON 3, OHIO

For more facts, circle No. 382
CONTRACTORS AND ENGINEERS

Versatile compactor combines rigid and pneumatic rolling

A versatile new machine, the Seaman-Gunnison Duo-Pactor, combines two types of compaction in a single unit. The Duo-Pactor has eight oscillating wheels for pneumatic compaction and a steel roll. Either type of rolling can be used independently or the two can be combined.

Typically, on the first pass over newly laid paving material, the Duo-Pactor is used for low-pressure rolling. Both the steel and the pneumatic compaction wheels are working in this step. Then the steel wheel is raised to increase the ground pressure on the pneumatic tires. This is followed by another pass with the steel wheel alone to flatten ridges and to produce a fine surface texture. Ground pressure can be varied from 50 pounds per linear inch unballasted to 425 pounds with full ballast. The Seaman-Gunnison machine has a gross weight range of 6 to 19 tons.

The pneumatic-tire rolling width is 86 inches and that of the steel roller is 72 inches. The Duo-Pactor can turn in a 19-foot width without scuffing or segregating materials. A torque amplifier that can be shifted at full power and at full speed makes it possible for the machine to make non-stop turns.

To minimize changes in the grade of the road surface due to compaction, the front drive roll has wheels that are unequally spaced and larger in diameter and width than those of the rear roll. This checks any tendency for the rear wheels to track in the grooves left by the front roll. For the same reasons, the rear rubber-tire assembly also has an unequal wheel spacing.

An International "300" prime mover with four-foot-diameter drive wheels pulls the Duo-Pactor. Either a gasoline or diesel engine may be specified.

Fully hydraulic steering, independent left and right-wheel, self-energizing brakes, and a parking brake lock are other features of this unusual machine.

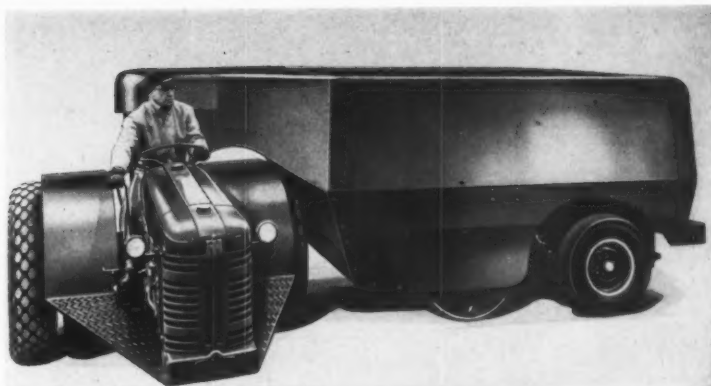
For further information write to Seaman-Gunnison Corp., 2763 S. 27th St., Milwaukee 15, Wis., or use the Request Card at page 18. Circle No. 178.

Heavy-duty engines

The Le Roi H540, rated at 190 hp, and the H844, rated at 285 hp, are shown in a new bulletin. Both models feature a 4½-inch bore and a 4¼-inch stroke, and the literature claims that this results in an economic high output. Charts, diagrams, specifications, engine applications, and lists of accessories are included.

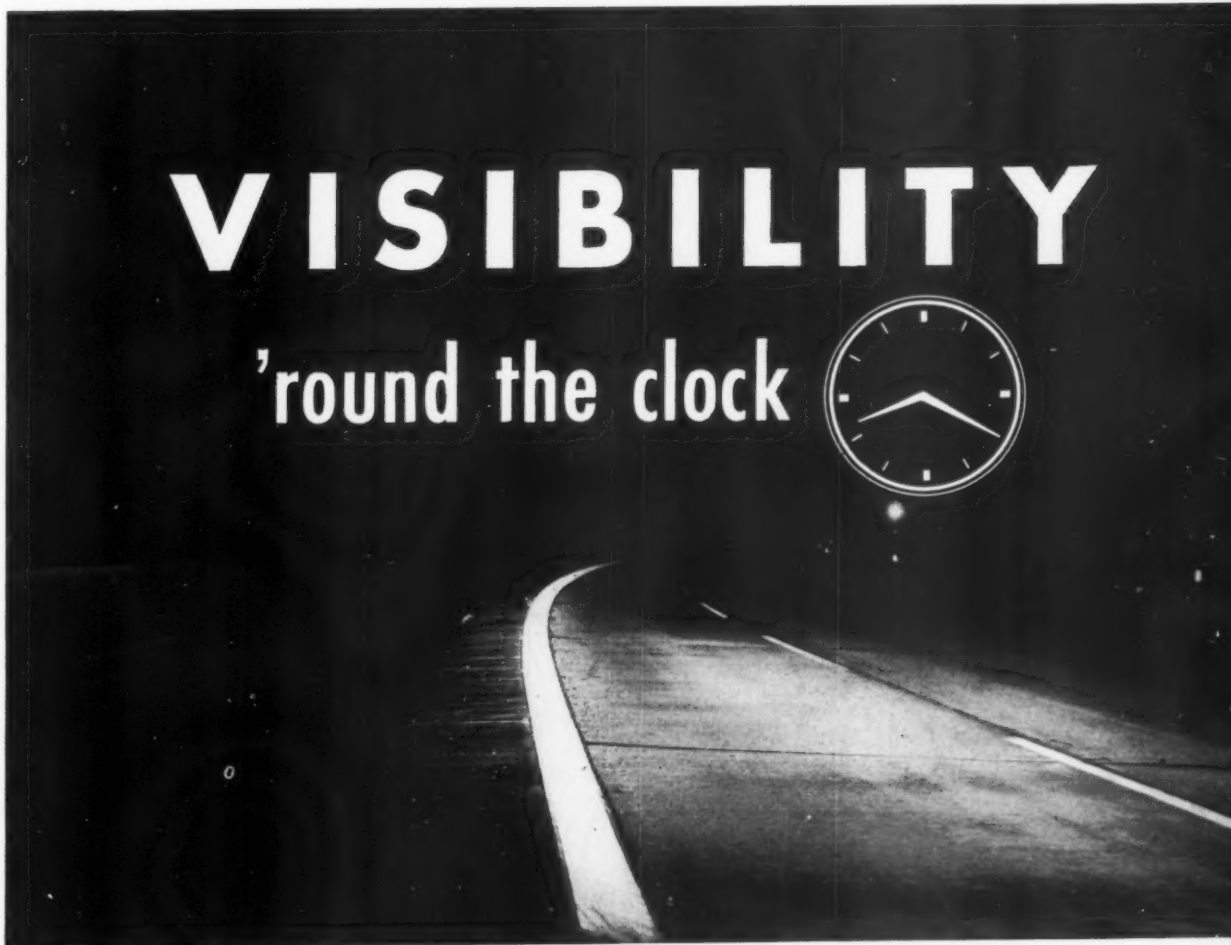
To obtain this bulletin write to the Le Roi Division, Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 2.

Seaman-Gunnison's unique Duo-Pactor combines rigid and rubber-tire rolling in one versatile unit. By varying ballast the gross weight of the compactor can be varied from 6 to 19 tons.



VISIBILITY

'round the clock



Center dividing strip with White Concrete reflecting curbs on Pennsylvania Turnpike.

White concrete reflecting curbs mean safer highways

This glistening band of white concrete guides millions of cars more safely along busy modern highways. Wet or dry, day or night, drivers can see every curve and slope far ahead of them.

By day, white concrete curbs made with Atlas White Cement stand in sharp contrast to the pavement. By night, saw-tooth surfaces of the curb

reflect headlight rays back to drivers. And on rainy nights, when highway visibility is at its worst, the wet curb surfaces become even more reflective forming a continuous strip of brilliant white—safely guiding drivers when the need is greatest.

That's why more highway designers and builders are including white concrete curbs made with Atlas

White Portland Cement in their plans for tomorrow's safer highways. Write for more information today.

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United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station

For more facts, use Reader-Reply Card opposite page 18 and circle No. 283



The 24-hour steam cure complete, a row of piles is air cured for 16 hours before tension is released. Reliable anchors hold the Roebling cables against a heavy steel plate.

Prestressed, composite piles support big cargo terminal

160,000-square-foot pier improvement requires 2,000 piles; units cast in special forms are steam cured at precasting yard

San Francisco's waterfront has a new 160,000-square-foot cargo terminal area ready to be pressed into service to solve a cargo-handling bottleneck of long standing. Completed last month under a \$1,313,870 contract by Ben C. Gerwick, Inc., San Francisco, Calif., the terminal spans the 200 feet of water between Piers 15 and 17.

A total of 2,000 prestressed concrete piles, of both the composite and solid type, were manufactured in a special yard at Petaluma, 50 miles away, then barged to the site, where they support a cast-in-place concrete deck topped with asphaltic concrete.

When Gerwick started work on March 3, 1955, the only terminal cargo space at Piers 15 and 17 was that within each warehouse. Both these 160-foot-wide warehouses, on pile piers, just 800 feet out from shore, and while four ships could be accommodated, there was not enough room for truck, trailer, and railroad facilities to handle the cargo at docksides.

Project officials expect that the new terminal will allow one full day to be cut from ship loading and departure time, even though vessels will be able to dock only on two sides and the bay end of the facility.

The floor level of the new area is 3½ feet lower than the level of the adjacent piers to permit trucks and trailers to be unloaded rapidly. Two railroad spurs, one on each side of the deck at pier floor level, also serve the area. With the terminal facilities completed, both warehouses will be enlarged by moving one wall of each structure toward the railroad tracks.

This job duplicated improvement work done a short time ago to help solve a similar cargo-handling problem at Pier 32. And like that earlier project, this one incorporated some innovations in construction.

Pile length reduced

One of the important phases of the work was the construction of a rock dike at the bay end of the two piers. Rock was barged to the site and dumped, then dredged material was brought into the enclosed area and dumped between the piers by barges that rode over the top of the rock dike at high tide.

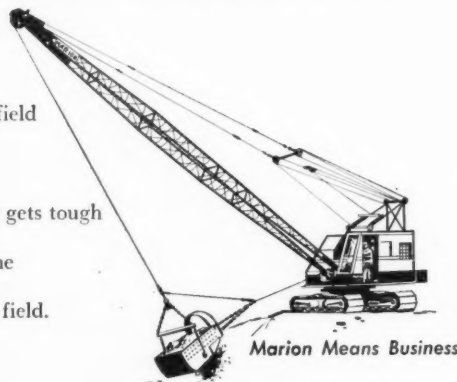
This reduced the depth of the water between Piers 15 and 17 from 35 to 9 feet at low water, and gave the con-

CONTRACTORS AND ENGINEERS



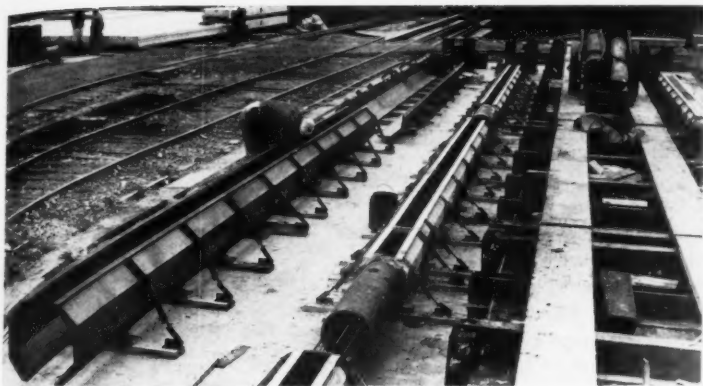
champions in their field . . .

Point! Flush! Retrieve! You thrill to the brilliant field work of an experienced Irish Setter. A glance tells you his sure-footed poise and his stamina when the going gets tough are the marks of a true champion. You'll recognize these same qualities in Marion's one-yard 43-M, a champion in its field.



MARION POWER SHOVEL COMPANY, MARION, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 384



Forms for the 20-inch octagonal piles, made of heavy-gauge steel hinged to a timber shoe at the bottom, are made ready by a workman. Pretensioning cables have been installed in the second row, while the third row of piles is being steam cured.



Workmen prepare the deck form with 5/8-inch plywood panels. These are re-used as deck construction stays about three bents behind pile-driving operations. The girts and heavy timber joists supporting the formwork were placed by workmen on rafts.

tractor two advantages. First, it was responsible to drastically reduce the unsupported length of piles to be driven, and second, it permitted the prestressed concrete portion of each composite pile to be shorter, since the wood sections of these piles would be buried deep in the mud fill. Specifications called for the head of timber pile sections to be driven 10 feet below the mud line—so that no rotting will take place—with the topmost prestressed pile section resting over the wood by means of a slip joint.

Piles prestressed

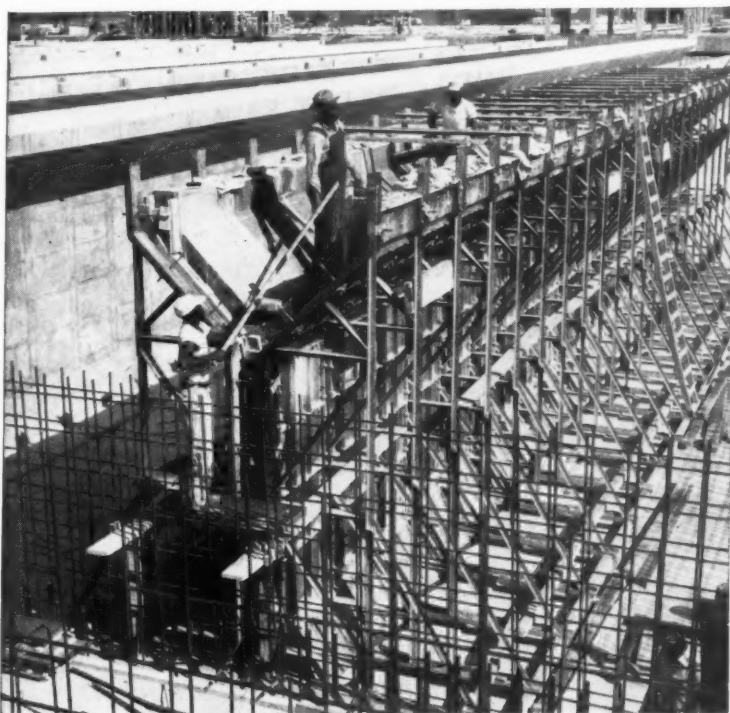
One of the most efficient features of the job, from a management as well as a construction viewpoint, was the prestressing and precasting of concrete piles on an assembly-line basis. This work was done at a yard—specially designed for the purpose—located at Petaluma, on one of the navigable upper arms of San Francisco Bay. Piles were transported by water from the yard to the pier site.

Two types of precast piles make up the total of 2,000 used for the pier improvement. Of this total, 1,863 are composite type piles, consisting of wood sections, 82 to 104 feet long, topped by 14-inch solid concrete octagonal pretensioned pile sections ranging from 23 to 28 feet long. These sections were manufactured on an assembly-line basis, 16 of them being turned out at a time.

The 14-inch octagonal pile sections have 11 3/8-inch-diameter Roebling high-tensile steel strands for pretensioning. Each of these 11 strands contains 7 wires. These steel sinews were pretensioned to a total pull of 14,500 pounds per wire by Rodgers hydraulic pumps and 200-ton jacks. At the lower end of these short sections of the pile were 4 feet of steel pipe, half of which was embedded in the concrete so that the necessary slip joint could be made over the wood section of the pile. The wood piles were lathe-turned before being rafted at Richmond so that the joint could be made easily at the driver.

The 139 20-inch octagonal-type prestressed piles, 131 1/2 feet long, contained an 11-inch diameter Sonovoid in the center. These piles were stressed with 18 3/8-inch-diameter Roebling 7-strand cable, the same

(Continued on next page)



Special Y wall forming system makes for simplified stripping operation. 100% reusability of all materials. Note complete absence of lumber normally required for shoring and bracing on this type of structure.

CUTS MATERIAL COSTS with Pre-Fab Form System on Sewage Plant Job

In the construction of the Miami Sewage Treatment Plant Job the Paul Smith Construction Co., of Miami, Florida chose to use the Uni-Form Panel System in the forming of one million sq. ft. of contact area. The contractor estimated that the use of the Uni-Form System saved 40 percent in material costs alone. In addition, faster form erection with fewer men kept the job moving ahead of schedule and reduced estimated labor costs considerably. These fine results were obtained even though this was the contractor's first experience with the Uni-Form Panel System.

This considerable savings in material and labor was realized in spite of intricate Y wall forming and pipe intersections which causes complicated forming problems with conventional forming systems.

Pre-fabricated, ready to use—completely engineered to handle most forming problems, the Uni-Form Panel System provides such advantages as simple assembly—minimum one side alignment and bracing—automatically accurate wall widths—positive internal spreading—faster stripping and maximum re-usage to give the contractor lowest all around form costs.

Y wall trusses designed to member with

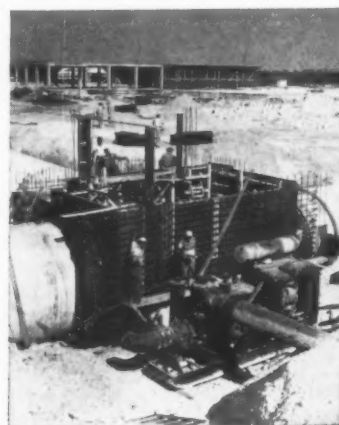
standard Uni-Form Panels formed a completely automatic system for handling the special forming problems, and were big factors in the economy and speed obtained on the job. Simple assembly of Standard Uni-Form Panels on the trusses eliminated many of the aligning, bracing and spreading problems usually encountered in Y wall construction. In addition to simplified forming the combination system of standard Uni-Form Panels and trusses eliminated many of the problems normally encountered in the stripping of a wall section of this type. The contractor was well pleased with all phases of his forming and stripping operations.

Why not investigate the many advantages the Uni-Form Panel System can bring to you? Write for the Uni-Form Catalog—or better yet, send us a set of plans for an estimate on your next job. Let us prove to you as we did to the Paul Smith Construction Co., that the Uni-Form Panel System can cut your forming costs.

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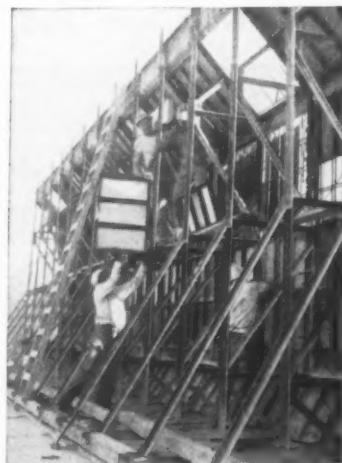
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Intricate forming in restricted areas presented no problem. Uni-Form Panels erected aligned and braced one side eliminated difficulties normally encountered in placement of reinforcing steel. Note Uni-Form Panels around large precast pipe.



One side alignment and bracing provides clear unobstructed working areas increasing job efficiency.



Y wall trusses incorporated alignment, bracing, shoring and scaffolding requirements.



With the hinged forms released, the piles are lifted clear by an Osgood rail-mounted crane. Piles will be painted with a coal-tar emulsion that will resist marine growth before they are barged to the site. ▶

(Continued from preceding page)

prestressing method is being used here as was sure for the smaller piles.

Both these types of piles were originally alternates on the plans. The 14-inch octagonal type was an alternate for a gunited timber pile, and the 20-inch prestressed octagonal type was an alternate for a regular precast-concrete pile which did not require prestressing. But the alternates were chosen after the Gerwick firm was able to prove that they would be efficient as well as economical.

Piles cast on special slab

The precasting yard is served by railroad, highway, and a narrow but navigable barge channel leading into

San Francisco Bay. At one end of the yard is the commercial concrete batching plant of Petaluma Ready Mix Co., a Gerwick subsidiary, which supplied concrete for the work. Gantry cranes and other facilities at the yard made it possible for the precast concrete units to be turned out on a mass-production basis.

The key to the rapid precasting and prestressing job was a reinforced-concrete slab, 480 feet long and 22 feet wide, supported by bearing piles. It was built in March and April, 1955, and accommodates four lines of precasting forms.

The forms themselves are unusual. Manufactured by a steel fabricator in the San Francisco Bay area, they consist of heavy-gage steel that is hinged to a timber shoe which forms the bottom face of a pile section. These forms remain stationary. After piles have been cured sufficiently, holding pins on the forms are released and the piles are lifted out.

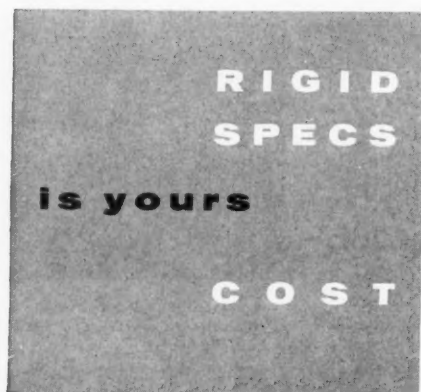
The 14-inch octagonal piles were precast in three rows of forms, set in place and carefully aligned by transit. At one end of the long table, 11 reels of Roebling cable were rigged up so that all 11 wires could be pulled simultaneously. The cable was secured at each end of the table by positioning plates and Reliable anchors, and the prestressing pull for 16 sections was applied by one pull on the system of cables. At each line of forms were 200-ton hydraulic jacking cylinders, powered by a Rodgers hydraulic pump, which gave the system a 175,000-psi pull—70 per cent of the ultimate strand strength of the wire.

After the prestressing pull had been placed on the pretensioning cables, the steel forms were closed and pinned so that they were secure against movement. Concrete used for the piles consisted of an 8-sack mix. Permanente's Pronto cement, which delivers a strength of 4,000-psi in 24 hours, was used. Commercially mixed at the nearby batch plant, the material was delivered by Challenge truck mixers, transferred to the steel forms by a Gar-Bro ¾-yard concrete bucket handled by a railroad-mounted Osgood crane, and consolidated by two Viber internal-type electric vibrators.

Precasting was done fast, a row of piles being turned out daily. As soon as a row of piles had been poured, prefabricated timber hoods were set over the piles in the entire row. These steam-tight hoods, in 16-foot-long sections, protect the piles and hold the moist heat while the pile sections are cured for 24 hours under a steam at 140 degrees.

Two Kewanee boilers with Minneapolis-Honeywell automatic controls sent steam through a header line and into the hoods at regular intervals. Automatic turn-on and cutoff devices installed inside the hoods kept the curing temperature constant. Foxboro automatic recording thermometers were set at two points along a row. This system established an almost laboratory control during curing.

After 24 hours, the steam hoods were removed and set on the next line of piles which had been cast while



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A trailer type roller containing a single 54" wide roll; with independent, clutch controlled, high frequency vibrating unit within the roll.

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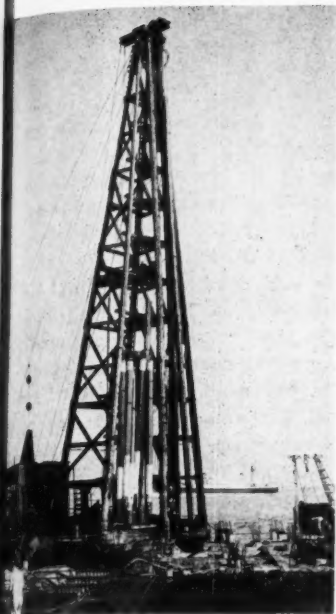
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The Vulcan 50-C hammer used to drive the piles is practically in the head block as a wood section of a composite pile is set. The lathe-turned end of this pile fits a pretensioned section, clusters of which are handled in the leads.

the first row was being cured. The steam-treated piles were air cured for 16 hours before the tension on the jacks was released. The pretensioned cables, gripped tightly by the high-strength concrete, then placed the pretensioning load on the concrete piles. Approximately four feet of cable between each pile section was cut in the middle with an oxyacetylene torch, and the top 2 feet of cable in each section was preserved intact so that it could be worked into the deck slab at the dock. After being painted with a coal-tar emulsion to resist marine growth, the piles were lifted with a two-point hookup by the railroad-mounted Osgood and loaded on barges for the 8-hour trip to the job site.

The 20-inch octagonal-type piles were manufactured in one row of similar steel forms and also cured by the steam-hood method.

Pile driving

Both the solid and composite piles were driven without trouble by conventional floating pile driver with 100-foot leads. This pile driver was equipped with a 150-hp upright steam boiler, a main American three-drum hoist, and several auxiliary Clyde steam hoists for the control of the rig. A special small steam hoist handled a shop-built steel ram that reached out and to grab the wood pile when the hammer was lifted. This made it possible to install a prestressed member on top of the wood at one setting and to drive the composite pile down without moving the driver. The steam hammer was a Vulcan No. 50-C with a special driving skirt that fit the timber piles and accommodated the cable ends on the prestressed sections.

The floating pile driver was positioned by means of its control cables so that the long piles could be driven to a tolerance of three inches. A 3/8-inch cable, stretched across the water between the docks, had Crosby wire-rope clips at 10-foot spacings so that piles could be centered. Wood piles rafted in from Richmond were picked up and driven to within three or four feet of the water. A wood pile was then gripped by the shop-made ram on the deck of the driver, the

For more facts, circle No. 388→

MARCH, 1956

hammer was lifted, and a prestressed concrete section slipped in place over the lathe-turned head of the pile. The head fit snugly inside the steel sleeve at the lower end of the prestressed section.

Since the floating driver could handle about ten pretensioned sections from its leads at one time, it did not have to move away from one location as it drove a composite pile. The limited space in the corners of the rectangular area made it impossible to have a pile raft on one side of the driver and a barge with prestressed concrete sections on the other, so a barge loaded with con-

crete piles was moored some distance away, and the pile driver moved over to it to pick up about ten of the prestressed concrete units as needed.

Final driving to ultimate bearing was not difficult. The pretensioned concrete sections, with heads protected by octagonally shaped wood cushion blocks, went down easily. There was no spalling of the concrete at the pile heads as a result of the hammer's action. The cable ends were protected during driving operations by slots in the hammer skirt.

The only pile driving difficulty occurred early in the job when a single-action hammer of an older type was

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And that's what you get with Blaw-Knox Batching Plants! Blaw-Knox batching speed comes from over-all balanced construction... operation of each component fits the others with dove-tailed precision. That Blaw-Knox better design and construction assures accuracy, another important consideration when you have to meet specs allowing 1/4 of 1% tolerance, as the plant illustrated did for one owner on the Ohio Turnpike.

Wherever you see a big turnpike project, you'll see Blaw-Knox batching plants. Perhaps the same ones you saw last year on the New York Thruway, you'll see next year on the Iowa Toll Road. They're adaptable to conditions in every section of the country.

Ask your Blaw-Knox dealer about the many sizes and combinations available to make money for you.



400 bbl. Mi-Bin and Cement Batcher fed by Blaw-Knox Elevator keep trucks rolling at a profitable rate.



100-ton, 3-compartment Aggregate Bin with twin batcher meets high speed paving requirements.

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Construction Equipment Division

Mattoon, Illinois

used. The slower rate of blows permitted some "fetching-up" to occur as the piles were driven, so that a longer time was needed to drive a pile. Substitution of the Vulcan 50-C double-action hammer increased production markedly.

The long 131½-foot 20-inch octagonal prestressed piles were driven by a larger floating driver—the "Pacific Titan"—one of two rigs which handled long steel H-beam sections under the Richmond-San Rafael Bridge. (See "Eight Construction Steps Hasten Pier Work on Span", C&E, April, 1955.) These longer piles were driven at the outer end of the dock shelf in deeper water.

Fast concrete work

Concrete work on the waterfront

moved rapidly, staying within about three bents of the pile-driving operation.

Form work started with 6×12 girts resting on 6×12 Douglas fir blocks fastened to each pile with 1-inch bolts. The blocks were bolted in place from small, floating rafts. Girts were placed when the tide was right, the timbers being floated in and set the proper elevation. The deck slab was formed from below with ¾-inch plywood panels. These were prefabricated at a central location, and were re-used many times. The plywood facing was nailed to 2×8 timber backing, which rested on the 6×12 girts. Removal of the forms from below was simple—men worked from rafts at low tide as they unloosened the bolts, then dropped the plywood sections

down and moved out to the edge to be picked up again for re-use. Two small skid-mounted hoists equipped with Gardner-Denver air tuggers were used to hoist these form sections.

Transit-mixed concrete was supplied by Jaeger truck mixers operating from the Pacific Coast Aggregates' commercial plant. The material was chuted to a receiving hopper at one end of a placing conveyor. There were two such conveyors, 75 and 60 feet long, mounted on rubber tires so they could be moved fast. Concrete was delivered rapidly through an elephant trunk to all parts of the 30×200-foot pour. Placing rates were about 40 cubic yards per hour with this method. After being finished off with floating tools, the concrete deck was cured with a black asphalt-type

solution that acts as a bonding agent for the asphalt surfacing.

Personnel

All field operations were under the general supervision of chief engineer S. S. Gorman of the California State Board of Harbor Commissioners, who was assisted by Jack Futscher, resident engineer. For Ben Gerwick, Inc., John Ford, Jr. was general superintendent and Jack Weiss, superintendent of the Petaluma precasting yard. Dorence Wainscott was in charge of reinforcing steel for Herrick Iron Works, San Francisco, a subcontractor supplying this material.

THE ENR

Nuts and bolts

■ Caterpillar Tractor Co. has released a booklet on nuts and bolts. The importance of the quality of the material from which they are made, the type of heat-treating given them, and the inspection method given them before use are discussed. The booklet is available in English, Spanish, French, and Portuguese.

To obtain this booklet write to Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 63.

Bituminous concrete group elects executive director

The former commissioner of highways for the state of West Virginia, H. Keith Griffith, has assumed the post of executive director of the National Bituminous Concrete Association. He will make his headquarters at the national office in Washington, D. C.

Griffith is also active in the American Association of State Highway Officials, and is a former vice president of the Southeastern Association of State Highway Officials.

**"Most
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says Roland L. Bowen, A. Bentley & Sons,
Toledo, Ohio



Gar Wood's exclusive Foundation Borer attachment has cut footing costs on many Bentley jobs. Machine bores a clean round hole, then bells hole at the bottom. Digs up to 26 unreinforced footings per day. Fast, positive hydraulic control. Completely convertible.

Four Gar Wood "75" excavators, two on crawlers and two on truck chassis, handle a wide range of applications more profitably for this leading contractor. Roland Bowen, master mechanic for the firm, says, "We've worked our 75's on bridges, tunnels, caissons, powerhouse and factories—and we've found them the most versatile, most satisfactory units we've ever used. Equipped with the foundation borer attachment, our 75's are used to drill for caissons . . . with the dragline to excavate for drainage. And, they're easily converted for steel erection."

Servicing is simple, too. "No special tools or presses are required," reports Bowen. "Since all shafts are splined, we can handle occasional repairs quickly in our own shop. Our repair bills have been practically nothing!"

Gar Wood "75's" deliver this kind of low-cost, dependable workability because they're built by specialists in ¾ yard machines. Find out for yourself how this specialization can pay off in more profit on your next job. Call your Gar Wood dealer or write: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

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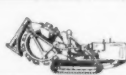
Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.



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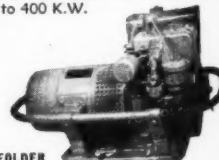
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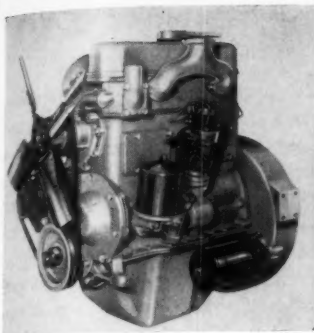
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Hercules Motors' new D.D. Series diesels have many parts in common with the new overhead valve G.O. Series gasoline engines.

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Corps of Engineers names Mediterranean engineer

The U. S. Army Corps of Engineers has appointed Col. Lawrence J. Lincoln Mediterranean Division Engineer. Presently acting chief of staff, Fourth Army, Fort Sam Houston, Texas, Col. Lincoln will assume his new post on May 1, succeeding Brig. Gen. B. B. Talley, who has retired.

Col. Lincoln has also served as district engineer at Denver and at Kansas City. During World War II, he served in the Southeast Asia Command, India, and in the Pacific Theater.

He is a graduate of the United

States Military Academy, West Point, The Engineer School, Fort Belvoir, Va., and the Army War College, Carlisle Barracks, Pa.

Catalog on V-belts

■ The care and maintenance of industrial V-belts are presented in a catalog from The B. F. Goodrich Co. Topics covered are: designing a new drive, double matching, installation, tension, alignment, cleaning, etc.

To obtain this catalog write to The B. F. Goodrich Co., 500 S. Main St., Akron 18, Ohio, or use the Request Card at page 18. Circle No. 94.

Spray lubricant

■ Moly-Spray-Kote, available in 12-ounce self-pressurized sprayers, is the subject of a folder from Alpha Molykote Corp. This nontoxic, noninflammable, and noncorrosive lubricant is said to prevent seizing, galling, and fusing of metal parts.

Moly-Spray-Kote may be used on warm surfaces. Under normal conditions, states the folder, the spray will dry in less than 10 minutes.

To obtain Bulletin 102 write to Alpha Molykote Corp., 65 Harvard Ave., Stamford, Conn., or use the Request Card at page 18. Circle No. 100.

Full engine line features interchangeable parts

■ Hercules Motors Corp., Canton, Ohio, has announced that it will shortly begin production on four new series of gasoline and diesel powered engines.

The Hercules line now includes L-head gasoline engines; solid injection, turbulence-chamber-type diesels; a new line of overhead valve gasoline engines known as the G.O. Series; and another new line of direct-injection diesels, the D.D. Series. Both the G.O. and the D.D. series are available in three different bore sizes and in four and six-cylinder construction. Also soon to be marketed are 3-cylinder models of these two series.

Hercules has planned its various lines so that models in each series may be used interchangeably at the customer's option. In the new Series G.O. and D.D., for example, not only are models of like size interchangeable but the lines also have many parts and components in common.

Cylinder blocks are interchangeable and designed so that they can be turned end for end. The flywheel housing and gear cover can be bolted to either end, permitting power to be taken from either end of the engine. This also permits the shifting of manifolds and accessories to either side, making it easy to fit the engine into the equipment it is to power.

Because of the extensive use of common components, it is possible to change a Hercules gasoline engine into a diesel unit by changing the pistons, the cylinder-head castings, the spark plugs and distributors for the fuel-injection nozzles and pump, the governor arrangement, and the manifold and carburetor on the gasoline engine for the air intake and exhaust manifold needed on the diesel engine.

Horsepower ratings for the 4-cylinder D.D. models range from 48 to 65 hp at 2,000 rpm. The 6-cylinder models in this series are rated at 75 to 97 hp at 2,000 rpm.

For the G.O. gasoline units, ratings range from 67 to 87 hp at 3,200 rpm for the 4-cylinder models and from 102 to 131 hp at 3,200 rpm in the 6-cylinder engines.

For further information write to the company, or use the Request Card that is found in at page 18. Circle No. 183.

For more facts, circle No. 391→



Big-tire haulers beat mud problem

A Canadian company had the problem of stripping 30 to 75-ft. layer of wet clay out of rock pockets. Soft and sticky with trapped-in moisture, this overburden was loaded by draglines, and hauled half a mile to waste dumps. Four C Tournapull Rear-Dumps were used to speed hauling.

Exceptional mud-ability

As owners everywhere have found, Tournapull Rear-Dumps go through mud which stops conventional truck-type haulers. On this overburden job, for example, these Rear-Dumps worked out of deep mud-holes in the pit and off dumps so soft a man could not walk through them. The exceptional mud-ability they showed is due partly to traction of big 21.00 x 25 low-pressure tires... partly to

electric power-steer through geared kingpin which "walks" Tournapulls out of trouble... partly to exclusive differential which automatically transfers power from slipping wheel to wheel on firmer footing.

On rough haul-roads, Rear-Dumps with 5'6" diameter tires haul faster than trucks. The big tires grip and roll over the bumps, cushion machinery and operator from road shocks.

Turn around non-stop

These Rear-Dumps also work faster and with greater safety in narrow quarters than conventional haulers. They turn around in much less space. When bowl is raised, they shorten wheel-base to turn non-stop

in an area about 1/3 less their overall length. This maneuverability speeds haul on narrow roads, reduces spotting time at shovel and dumps.

Dump fast and clean

Practically no clean-up is needed on the dump. With front-wheel drive, Rear-Dumps back safely to edge of bank. Bowl swings behind and below rear wheels... loads fall free and clear over the edge, with little spillage, seldom call for clean-up.

Ask your LeTourneau-Westinghouse Distributor to show you first-hand how Rear-Dump advantages can pay off on your work.

Rear-Dumps now available with optional tailgate.

Tournapull—Trademark Reg. U.S. Pat. Off. R-982-G-bw



Wide bowl-opening on Rear-Dump provides easy entry, big target for shovel, dragline, or conveyor loader. Units come in 11, 22, and 35-ton capacities.

Smooth, streamlined, unobstructed body dumping at 66° angle readily sheds sticky material.

Hauls to overburden dump are made at speeds up to 32 mph by this C Rear-Dump.



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Unique batch plant set-up speeds work on industrial center

*Aggregate transfer is done without crane and bucket;
topsoil graded from 30-acre site is saved as backfill*

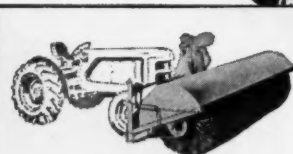
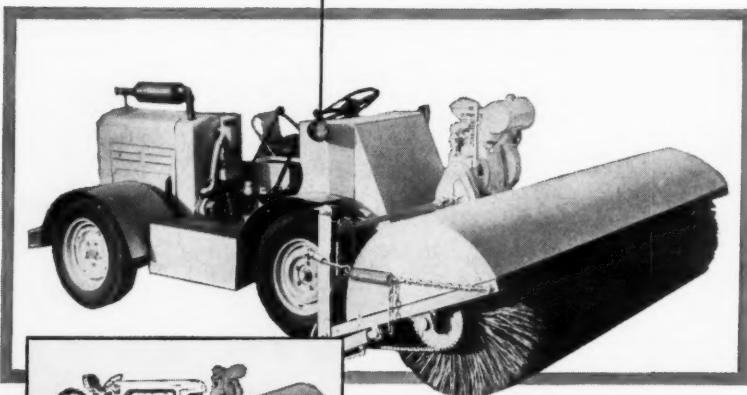
In constructing a reinforced-concrete slab foundation for the \$5 million Goodyear distribution center at Brook Park Village near Cleveland, Ohio, the contractor had his batch plant charged with aggregate by a conveyor, eliminating the need for a crane and clamshell to do this work. Altogether 20,000 cubic yards of concrete were required for this job on the facility, which is believed to be the largest distribution center ever built for the rubber industry.

The center, being built for the Goodyear Tire & Rubber Co., Akron, Ohio, will consist of two one-story skeletal-steel buildings. A warehouse with 68 overhead truck doors and protective canopy will provide approximately 17 acres of storage space, measuring 1,442 x 432 feet.

The second structure, providing 20,

LITTLE GIANT Self-Propelled SP-C Sweeper

A Big Sweeping Job in a Low Cost Package



Independent Brush assembly can be installed on any prime mover by use of adaptable hitch plate and support channels. Ask your Little Giant dealer for facts on the low cost SP-C or Independent Brush assembly... or write direct.

The SP-C...

- Speeds to 40 MPH
- Prime power—48 HP water-cooled engine; brush power—Wisconsin A.E.N. engine
- 6-volt electric system
- Hydraulic brakes
- Turns in 22 feet
- Hydraulic brush control
- Fully adjustable brush
- Choice of 6', 7' or 8' brush

Power, speed and the ability to sweep cleanly fit the money-saving SP-C for any sweeping work.

Prime mover has high speed for moves from job-to-job; a choice of speeds for sweeping. Weight is concentrated on front drive wheels making steering easy.

Independently-driven brush maintains constant, positive sweeping action regardless of forward speed. Entire brush assembly can be dismantled in two minutes.



**LITTLE GIANT
PRODUCTS, INC.**
1600 N. ADAMS • PEORIA, ILLINOIS

Manufacturers of quality products since 1919.

▲ Column supports for the concrete batch plant are placed by a Lorain Moto-Crane. A conveyor belt will transfer aggregates from the concrete box, foreground, to the hopper of the plant, eliminating the need for a crane.

C&E Staff Photo



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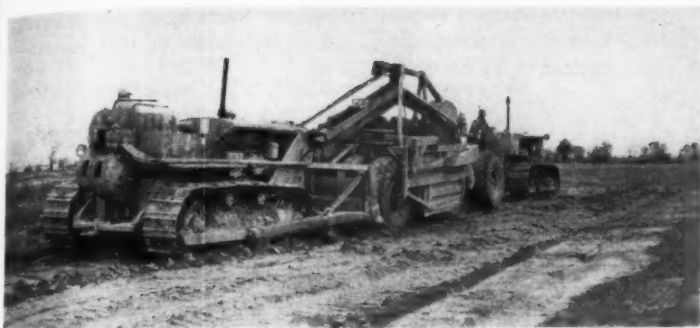
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CONTRACTORS AND ENGINEERS



A LeTourneau 18-yard scraper drawn by a Caterpillar D8 and push-loaded by another D8 removes topsoil during grading operations at the new Goodyear Distribution Center. The 22,000 cubic yards removed will be used later as fill. C&E Staff Photo

800 square feet of office space for district sales and operating personnel, measures 80 x 260 feet. This building will have masonry walls, acoustic ceilings and rubber-tile floors, and will be air conditioned.

Large area cleared

Starting work last September, Hunkin-Conkey Construction Co., Cleveland, contractor on the job, cleared 30 acres for the necessary parking areas, access roads, and the two buildings. A fleet of LeTourneau 18-yard scrapers drawn by Caterpillar D8 tractors and push-loaded to capacity by two other D8's removed approximately 22,000 cubic yards of topsoil during grading operations.

The excavated material, deposited near the edge of the project site, will be used later for landscaping and backfilling. This fill was maintained in hill-type mounds by Caterpillar D8 tractor-dozers.

The foundation of the huge warehouse consisted of a 6-inch-thick reinforced-concrete slab resting on a 4-inch blanket of run-of-the-bank gravel. Foundry sand from a nearby Ford manufacturing plant brought the final elevation of the subgrade, beneath the gravel blanket, up to grade. Since it serves also as the warehouse floor, this foundation slab was topped with a smooth cement finish.

Concrete batch plant

A Blaw-Knox batch plant at the other end of the site furnished the concrete required for the job. A Lorain Moto-Crane with an 80-foot boom erected the steelwork for the cement silo and the aggregate bin. Column supports for the batch plant were erected on concrete pedestals which are embedded about four feet in the ground.

To supply the hopper with aggregate, which consists of two sizes of crushed slag and sand, Hunkin-Conkey built a reinforced-concrete box, 23½ feet long and 7½ feet deep, in the ground adjacent to the hopper. Its walls are 9 inches thick. Crushed slag and sand are stockpiled around this concrete pit as they are delivered, and when aggregates are needed in the hopper, a tractor-dozzer pushes one size into the pit. Then an inclined conveyor belt, extending into the box, raises the aggregate to the hopper. Three out of four bin compartments are used for the slag and sand. With this method of transferring the aggregate from the stockpiles to the compartments, the crane

For more facts, circle No. 395→

MARCH, 1956

with clamshell, usually used in batch-plant operations, was not necessary.

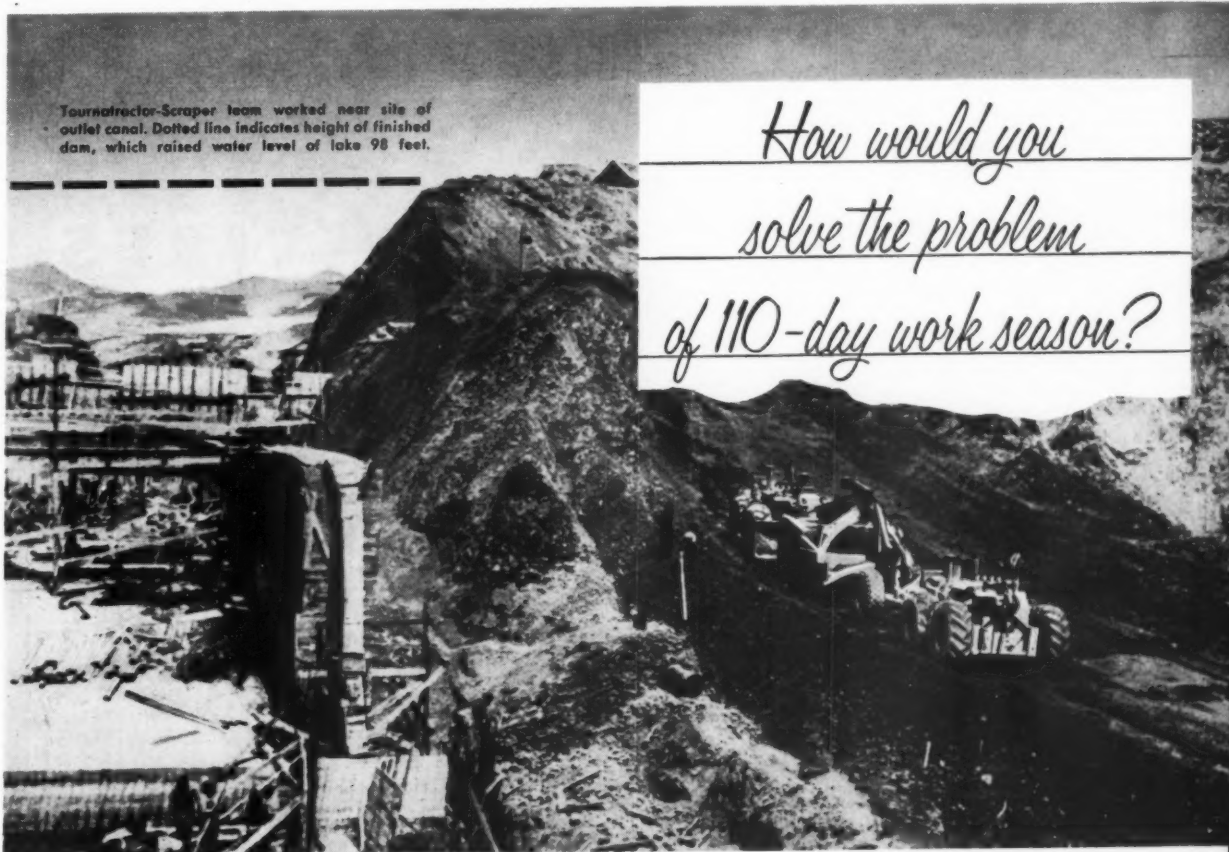
Cement, on the other hand, is handled in the standard manner. Trucks, delivering bulk cement, unload over a screw conveyor which feeds a 45-foot enclosed elevator raising the cement to the 250-barrel silo. Cement is transferred by gravity from the silo to the fourth compartment of the aggregate bin.

After the proper quantities of sand, the different sizes of slag, and cement are weighed out per batch, they are dumped into ready-mix trucks for delivery to the foundation forms. Water for the mix is obtained from

local water mains which are metered to measure the quantities used by the contractor. Forms for the foundation-slab pours were fabricated in place.

Ditches for drainage, water, and electrical, utilities were dug by a Hyster backhoe attachment mounted on a Caterpillar D8 tractor. This attachment, with a 1½-yard bucket, has its own operating levers and is powered, through a master clutch, by a takeoff on the tractor's driveshaft. Easily maneuvered around the project, this rig also handled small excavation work.

Scheduled for completion in July,



Tournatractor-Scraper team worked near site of outlet canal. Dotted line indicates height of finished dam, which raised water level of lake 98 feet.

*How would you
solve the problem
of 110-day work season?*

You'd probably do the same thing Endesa did in Chile. They used high speed on rubber to get as much work done as possible during the limited season

Few places in the world ever presented greater difficulties for construction than the mountainous area east of Talca, Chile. Heavy snow—often 32 ft. deep—stopped all work for six months. Spring thaw prevented earthmoving for another month or two. By the time the snow melted and the ground dried out, construction season was reduced to only 100 to 110 working days. Even during this time, conditions were far from ideal. Machines had to load material which rapidly became sunbaked, hard and dry. Hauls were made through heavy

dust, and up and down steep grades with horsepower reduced by altitudes of 7800 to 9800 feet.

However, Empresa Nacional de Electricidad (Endesa) solved these dirtmoving problems with modern, high-speed, rubber-tired Tournatractors. These tractors-on-rubber started work on the 431,000-cu. yd. earthfill dam across the outlet of Maule Lake, world-famous trout fishing spot. The dam, which is now complete, controls flood waters and generates electricity, increasing prosperity for the entire Talca area, as well as the city of Santiago.

Due to the speed of the Tournatractors, all earthmoving was finished in two seasons (about 220 days). Three of the four tractors were regularly used with 16-cu. yd. LeTourneau-Westinghouse Carryall Scrapers to load, haul, and spread. The other tractor-on-rubber handled push-loading.

Endesa officials say 19 mph speed and ability to maneuver rapidly in close areas, helped Tournatractors out-produce, by a wide margin, the crawler-type tractors they replaced.

"Provide needed speed"

Chief Engineer of Construction, Sr. Santiago Bonhomme, said, "The urgency of finishing this important project made imperative the use of fast earthmoving equipment like Tournatractors. Unquestionably, their traction helped us speed the completion of work."

Tournatractor can offer you high-speed, low-cost production for your projects, too. See your LeTourneau-Westinghouse Distributor.

Carryall, Tournatractor—Trademark Reg. U.S. Pat. Off. T-979-G-b



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

the distribution center is being built according to plans and specifications drawn up by the architectural division of the Goodyear Real Estate Division, Akron.

The center will be served by a spur of the New York Central Railroad running into the 30-car-capacity warehouse. Trucking will have easy access to the center from the nearby Ohio Turnpike. Once the St. Lawrence Seaway is open to traffic, the company's export business will be handled from the new center, which will serve as a distribution point for tires and a variety of other Goodyear products.

W. W. Trimpey is the superintendent for Hunkin-Conkey Construction Co.

THE END

manufacturer memos

Joy elects new president, changes executive staff

The Joy Mfg. Co., Pittsburgh, Pa., has elected John Lawrence to the position of president and chief executive officer of the firm. He succeeds J. D. A. Morrow, who has retired as president to become chairman of the board.

At the same time, the firm advanced W. L. Wearly to the post of executive vice president and H. C. Nyquist to vice president in charge of general sales.

Mr. Lawrence, a graduate of Massachusetts Institute of Technology, has been a member of the Joy organ-

John Lawrence,
the new president
of Joy Mfg. Co.



ization since 1951, when he started as vice president in charge of manufacturing. At the time of his present appointment, he was executive vice president.

Mr. Wearly had formerly been vice president in charge of general sales,

and Mr. Nyquist had been vice president in charge of coal machinery sales.

Master Builders expands research lab staff

The Master Builders Co., Cleveland, Ohio, a subsidiary of American-Marietta Co., and manufacturer of technical treatments for concrete and masonry, has expanded its research



Stephen W. Benedict, vice president in charge of research and engineering for Master Builders Co.

laboratory administrative and supervisory staff.

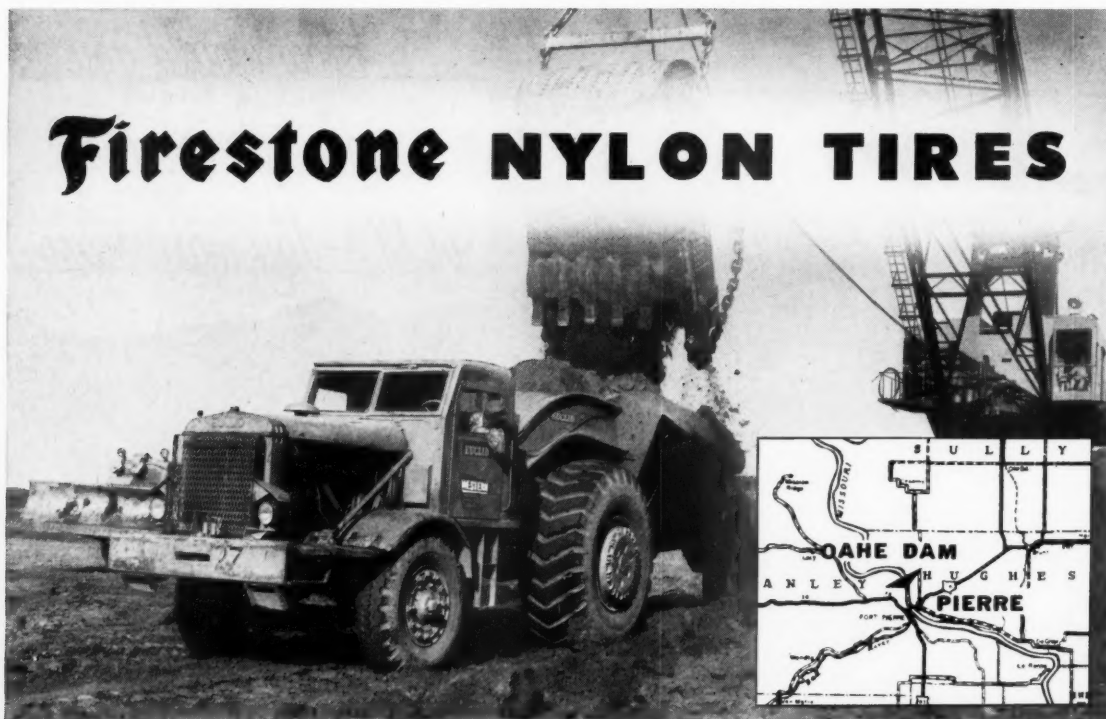
Heading the staff, as vice president in charge of research and engineering is Stephen W. Benedict. He will be assisted by Herbert K. Cook, director of engineering, Thomas M. Kelly, director of research, and Perry H. Petersen, assistant director of engineering.

Mr. Benedict, a civil engineer, replaces Dr. Edward W. Scripture, Jr., who has retired. With Master Builders since 1948, Mr. Benedict has also served as a materials engineer with the National Bureau of Standards.

Crane Carrier appoints four to executive posts

The promotions of four men have been announced by the Crane Carrier Corp., Tulsa, Okla., manufacturer of heavy-duty truck chassis and the Mixer-Master truck mixer.

Ken Williamson has been named vice president and general sales man-



MOVING 60,000 CUBIC YARDS A DAY TO HELP TAME THE MIGHTY MISSOURI

THE earthmoving unit shown above is typical of the many Firestone equipped units that are running round the clock to speed construction of Oahe Dam on the Missouri River. When completed, Oahe Dam will be the largest rolled filled earth dam in the world.

It is on projects such as this that Firestone nylon tires prove their superiority in reducing tire costs and downtime.

Firestone nylon tires are built for the toughest service. The treads give maximum traction and

they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned Gum-Dipped nylon cord body gives greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone nylon tires will cut downtime and increase the profits on your job.



A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP GG WIDE BASE ROCK GRIP RG WIDE BASE ALL NON-SKID ALL TRACTION RIB EXCAVATOR

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE

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ERS

ager, and Ted O'Shields has been appointed vice president and chief engineer. Assistant vice president and administrative officer is Phil Maisel, with Bill Shames serving as assistant vice president and production manager.

R. C. McDowell heads Wellman Engineering

R. C. McDowell has been elected president of the Wellman Engineering

Robert C. McDowell, newly elected president of the Wellman Engineering Corp.



Co., Cleveland, Ohio, subsidiary of the McDowell Co., Inc., also of Cleveland. He has been president of Wellman's board of directors since 1954 when the McDowell organization acquired Wellman.

He succeeds Dr. J. C. Hodge as president.

Mixermobile appoints three new executives

In a program of company reorganization, Mixermobile Manufacturers,



V. C. Dirksen, sales manager of Mixermobile Manufacturers.

Portland, Oreg., has appointed three new executives.

V. C. Dirksen has been named to the position of sales manager. He will be assisted by Glen Ede, the new sales promotion manager. Joe M. Larson has been appointed controller.

Dart names sales manager

The new general sales manager for the Dart Truck Co., Kansas City,



Walter C. Clayton, new general sales manager of the Dart Truck Co.

Mo., is Walter C. Clayton. With the firm's sales department since 1928, Mr. Clayton has pioneered many improvements in heavy-haulage trucks and was instrumental in adopting truck transportation hauling for ores in the West and South America.

A-C appoints manager

E. J. Mercer has returned to this country from Essendine, England, where he had been managing director

For more facts, circle No. 398-

of Allis-Chalmers Great Britain, Ltd., to assume his duties as general man-



E. J. Mercer, general manager of the construction machinery division of Allis-Chalmers Mfg. Co.

ager of the firm's construction machinery division in Milwaukee, Wis. Joining the company in 1937 as a student engineer, Mercer has since

served in several sales and managerial capacities.

Thor names vice president

The former vice president in charge of labor relations of the Thor Power

John A. McGuire, newly elected vice president of the Thor Power Tool Co.



Tool Co., Aurora, Ill., John A. McGuire, has been elected a full vice president of the firm. With Thor since 1939, he has served as manager of the accessories division and as secretary of the company.

The new vice president in charge of manufacturing is Dean C. Smith. He is the former general manager of the Aurora works. George A. Kautz, a member of the accounting staff, has been appointed assistant treasurer.

Friendly neighborly help to our fellow men is given by the American Red Cross—join up and join in!

How Miller Excavating Co. hauled mud from 10 feet below water level

Excavating 280,000 yards for an underground, U.S.

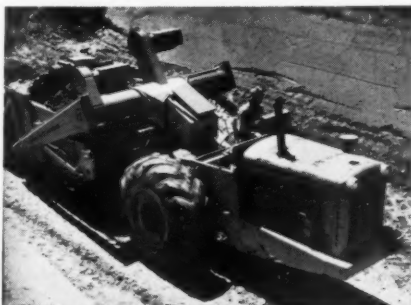
Air Force building, Miller Excavating Company, Omaha, Nebraska, faced the problem of deep cuts in wet clay and steep adverse grades. The company assigned this job to 2 C Tournapulls, a 20-yard tractor-drawn scraper, a dragline, and a 190-hp crawler-pusher.

Machines went to work moving the wet clay and loam so the foundation slab for this three-story building could be laid 10 feet below ground-water level. The deeper the hole was dug, the wetter it became, and the harder to work. Even though the pit was drained by a wellpoint system, material at the bottom of the excavation was soft and slippery. To make matters worse, frequent showers added to the rough going.

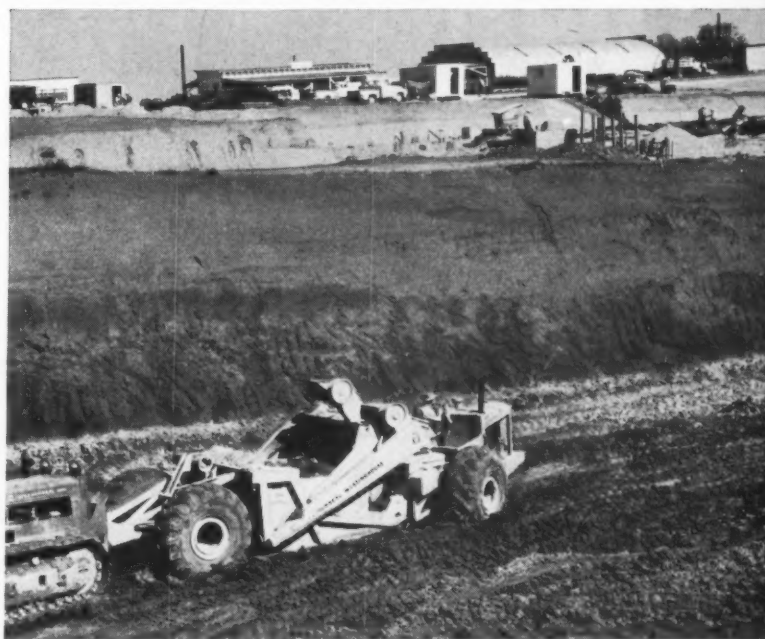
"C's" handle mud easily

Traveling through this mud, each of the "C's" averaged a 1000' cycle in 9 minutes. 132 pay yards were delivered by the 2 units in an average 55-minute hour.

The two "C's" moved 70% of the 280,000 yards involved. 30% was moved by a 20-yard tractor-drawn scraper loaded by dragline.



Working in second gear, C Tournapull hauls 11 pay yards of very heavy wet marl up a steep, slippery grade in this excavation for a three-story, underground office building.



Pushed 120 feet by a 190 hp crawler, C Tournapull loads better than 11 pay yards of heavy, wet marl. The "C's" working 8 hours

per day, 6 days per week, on this excavation project experienced no downtime for repairs during two months continuous operation.

In the poor footing, Tournapulls' exclusive power-proportioning differential automatically transferred power to the wheel with firmer footing. In extremely slippery underfoot conditions, operator also used Tournapulls' electric power-steer through geared king-pin to pivot prime-mover in alternate directions, "walking" his machine to

firmer ground. Steer can swing prime-mover up to 90°.

Compact fill in normal travel

Once out on the fill, "C's" spread full loads over a distance of 71' in 40 seconds. "C's" big rubber tires helped to compact fill, building a firm surface in ordinary travel.

Says Operator Wm. Welch, "Tournapull is a good machine. This job is rough, but Tournapulls move a lot of earth, handle loads easily."

Get the full story

The experience reported here is one of many showing how Tournapulls' rubber-tired speed, electric power-steer, and power-proportioning differential assures lowest-net-cost-per-yard under all job conditions. Write or call your LeTourneau-Westinghouse Distributor for details.

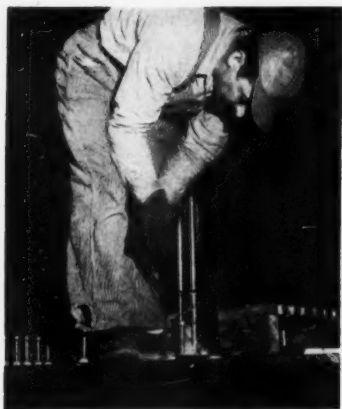
Tournapull—Trademark Reg. U.S. Pat. Off. P-886-P-b



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



A 3/4-inch-diameter 4-inch-long Nelson granular flux-filled stud is end-welded with a Nelson heavy-duty NS-9 stud-welding gun powered by a 2,000-amp Nelwelder.



Corrugated steel sheets, laid over wooden falsework, serve as a form for the reinforced concrete on the Fort Pierre, S. Dak., bridge. Nelson granular flux-filled studs were substituted for steel angles to facilitate placing steel and compacting concrete.

End-welded studs serve as bridge shear connectors

New method is first used on steel and concrete bridge; technique proves four times faster than hand welding

Using end-welded studs as shear connectors in the erection of a continuous-girder, a composite steel-and-concrete bridge across the Bad River at Fort Pierre, S. Dak., marked the introduction of stud welding as a major new factor in reinforced-concrete construction.

This new application of granular flux-filled studs, made by the Nelson Stud Welding Division of Gregory Industries, Inc., Lorain, Ohio, has already received widespread acceptance among designers, steel fabricators, and contractors. In addition to the bridge at Fort Pierre, the method is being used on bridges now under construction in South Dakota, Georgia, California, and New Jersey, and the Nelson shear stud is now being shown as an alternate on bridges being designed in 22 states where composite spans are used.

In many instances, studs are being welded in fabricating shops, but the method lends itself to field installation because of the portability of the equipment.

Efficient, fast

K. R. Scurr, bridge engineer of the South Dakota Department of Highways and designer of the composite bridge erected over the Bad River, pointed out that one of the principal reasons for substituting studs for the steel angles originally specified as shear connectors was the fact that studs permit concrete to be compacted more satisfactorily. This assures interaction between the concrete slab and the steel beam.

The distortion and warping caused by hand-welding other types of shear connectors to bridge girders is eliminated with studs. According to the beam fabricator, the stud shear connectors were end-welded to the flanges of the girders approximately four times faster than the estimated time that would have been required for hand-welding other equivalent shear connectors.

Welded by the Egger-Scudder Co., Sioux Falls, S. Dak., the beams were trucked about 200 miles to the job site. Only two studs were bent while being

ROME DISK-PLOWING HARROWS



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- ✓ STABILIZING
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Perfect base finishing tool for stabilizing, aerating and mixing base materials on fills or cuts on highways, dams, airports and levees is a Rome Disk Plowing Harrow. It spreads and smooths off surface irregularities, cutting and mixing base materials to a depth of 9" or more per pass, leaving soil in a mellow condition for thorough, dense compaction.

When your job calls for pioneering through small trees and underbrush—a nuisance for bulldozer equipment—call out the Rome. It cuts and chops dense growth, often removing roots and all. Ideal for right-of-way maintenance, and an essential step in site preparation.

Whatever your base preparation, dirt moving or clearing problem, there's a Rome Disk Plowing Harrow to match your needs and your equipment. See your Rome-Caterpillar Dealer for all the facts.

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IS YOUR
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Rome Disk Plowing Harrows

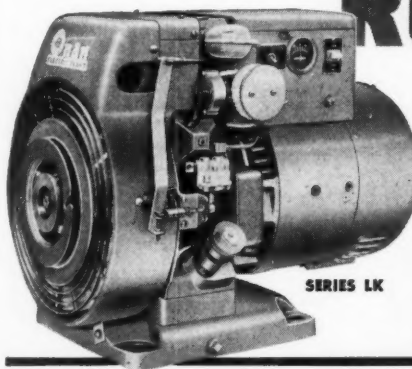
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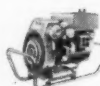
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Put it to work on your toughest jobs!



PORTABLE POWER

Stands up under rough handling. Carry it, wheel it, or truck it.



PRIMARY POWER

Runs longer in continuous service. Dependable, economical.

Built to stand up where others can't! Powered by Onan 4-cycle, one-cylinder gasoline engine with Stellite-faced exhaust valve, longer-wearing bearings, efficient air-cooling. Onan all-weather generator is direct-connected. Compact, lightweight. Conservatively rated; economical operation. 115 or 230 volts, A.C. Recoil starter, electric starting, or automatic start and stop. Wide range of accessories. Other Onan models: 500 to 50,000 watts.

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CONTRACTORS AND ENGINEERS

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During concrete-pouring operations on the first composite bridge using Nelson granular flux-filled studs as shear connectors, heated enclosures were provided for the workmen. ▶



A Koehring crane buckets concrete to a buggy making bridge pour. Using end-welded studs on the job permitted a more positive bond between the concrete and the steel beams.

moved into place.

Egger-Scudder reported that shop time was reduced because preliminary tack welding, shearing, grinding, and other machining, often required with shear connectors, could be eliminated.

The Fort Pierre bridge, a continuous-girder structure of five girders, has shear connectors in the positive-moment sections of each girder. These sections are approximately 68 feet long for both end spans and interior spans. Flanges to which the studs are welded are 14 inches wide. A total of 8,300 Nelson granular flux-filled studs, 3/4 inch in diameter and 4 inches long, with upset heads, were end-welded to the girders in lateral rows of six by a Nelson heavy-duty NS-9 stud-welding gun powered by a Nelwelder 2,000-amp generator.

A special wooden loading frame minimized stud handling so that the operator could weld studs at a rate of five to six a minute. Studs were placed in the loading board with six studs in a row in the frame. The operator then pressed the gun over a stud in the frame, placed the end of the gun through a ceramic ferrule which had been positioned on the girder, and pressed the gun's trigger. Studs were spaced on 2-inch centers in the rows, and rows were 12 to 24 inches apart.

After the beams had been placed at the bridge site, wooden falsework was erected, and corrugated steel sheets, serving as a form for the concrete, were laid over the wood between the girders. The sheets were left in place after the concrete was poured.

The Nelson shear connector studs, permitting a clean design and flexibility in placement, may be spaced wherever required, regardless of the location of the transverse slab reinforcement.

Finding that the studs were convenient as aids in spacing mat for reinforcing bars, the contractor was able to tack-weld the spacer bars on the studs and to fabricate the mat in place with positive support to the spacer bars.

Test program

The engineering and design data leading to the wide acceptance of Nelson granular flux-filled studs as shear connectors was based upon a comprehensive test program.

(Concluded on next page)

For more facts, circle No. 401→

Versatile "D" Tournapull



has a place on EVERY dirtmoving job

Every "big" dirtmoving job breaks down into work sections... some suitable for "big" equipment... some suitable for "small" equipment.

The improved D Tournapull fills the need for a fast, flexible, self-propelled scraper which works economically on both big and small-yardage assignments and on both long and short hauls.

Its capacity is 5.9 cubic yards, struck, or 7 cubic yards, heaped. It is large enough and fast enough for profitable use in pusher fleets... yet small enough for one-man self-loading. It cuts delays and expense for small yardage sections, clean-up, access roads, shoulders, drainage and other headache jobs that normally eat into your profits.

Not only is the "D" highly versatile, but it runs from one location to the next at speeds to 28 mph.

It travels anywhere... over highways or cross-country, over curbs, railroad tracks, bridges. It works fast... moves more earth in less time than big crawler tractor-scraper combinations costing thousands of dollars more.

Pictures show some of typical applications. Look over your current dirtmoving projects and you'll find many of these assignments... and others... where "D" can speed completion and cut your costs.

If you want more information on the D Tournapull, or if you would like to see a demonstration on your job, call your LeTourneau-Westinghouse Distributor. He is always at your service.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-885-G-b

Backfills around culverts



Backfills around buildings



Shapes back slopes



Fine-grades before paving



Blades shoulders



Cuts drainage ditches



Spreads gravel



Handles clean-up



Spreads top-dressing



Fills hoppers



Does production dirtmoving



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

(Continued from preceding page)

hensive test program of stud-welded shear connectors and fatigue tests of bare studs carried out in 1954 and 1955. The tests, conducted under the direction of Dr. I. M. Viest, research associate professor in the department of theoretical and applied mechanics at the College of Engineering of the University of Illinois, proved that the studs were reliable shear connectors and provided the necessary design and loading data. On the basis of the tests, the stud dimensions recommended as being the most economical for shear connectors were $\frac{3}{4}$ and $\frac{7}{8}$ -inch diameter and 4-inch length. For special requirements and where design dictates, additional length studs, up to 8 inches or longer, are available.

In addition to the bridge work, Nelson stud shear connectors were used in the structural framework of the research laboratory recently erected by the International Business Machines Corp. at Poughkeepsie, N. Y. Several other composite buildings, now under construction, are also using studs as shear connectors.

The use of end-welded studs in reinforced-concrete construction has become increasingly widespread. They are now being used as concrete anchors in curbing and as basic fasteners for window assemblies and other preassembled components in modern fireproof buildings. In this case, the studs are end-welded to steel inserts cast in concrete.

THE END

Self-propelled dredge digs run-off canal

Work of canal dredge helps drain swamp in airport maintenance job; hydraulically controlled rig features several advances in design

A drainage ditch, dug across $\frac{3}{4}$ mile of swamp land and through several layers of different types of earth near Glen Burnie, Md., solved a major maintenance problem at Baltimore's Friendship International Airport. The need for the ditch arose after last August's torrential rains overtaxed the existing drainage facilities and flooded parts of the terminal.

Swamp water running into the ditch will empty into an adjacent lake. This gradual elimination of water will bring the soft land up to a stable consistency.

But when work on the project began, the swamp land was so unstable that operation of a hydraulic dredge or dragline was impractical, and a newly designed canal dredge, developed by Ellicott Machine Corp., Baltimore, was brought in. Operated by a local contractor, the Canal Dredge dug a canal 16 to 17 feet wide at the water level and 4 to 5 feet deep.

A swing-ladder-type unit, the canal dredge is especially constructed for digging and maintaining narrow irrigation and drainage canals. With a hull 11 feet wide, 3 feet deep, and 28 feet long, and with a dry weight of approximately 18 tons, the machine was easily transported to the dredging site by truck and lifted into the

MAGINNISS

UNI-LECTRIC CONCRETE VIBRATORS

... ideal for smaller concrete jobs!

- universal type motor—plugs into any 110 volt current
- motor-in-head design—cooled by surrounding concrete
- easily handled by one man—no cumbersome flexible shaft and motor
- completely self-contained—can be carried in car trunk or truck tool box
- produces powerful high frequency, low amplitude vibrations for best results—10,000 VPM



Model UCV-9

SPECIFICATIONS

MODEL UCV-9

HEAD—2 $\frac{3}{8}$ in. diameter; 14 in. long; weight, 11 lbs.

MOTOR—universal 110 volt ac-dc type; heavy duty brush rigging and commutator; wound armature runs on 2 shielded high speed ball bearings; 10,000 rpm

ECCENTRIC—one-piece alloy steel; designed to match motor characteristics; runs on 2 shielded high speed ball bearings

CABLE—standard 10 ft. operating hose; heavy duty concrete-proof operating switch; 50 ft. rubber-covered 3 conductor cable (3rd wire ground); male 3-prong plug with female connector for attachment to extension cord.

Maginniss Uni-lectric universal concrete vibrators handle medium or high slump concrete effectively. They use on-the-site power (including the dc output of Maginniss Hi-lectric generators, if desired)—are easily carried from job to job. Their cost is low! And, manufactured by the same Maginniss craftsmen who produce heavy duty Hi-lectric vibrators, Uni-lectrics will deliver a maximum amount of dependable service.

Larger contractors will find the Uni-lectric a handy companion for their heavy duty Hi-lectric concrete vibrators—perfect for occasional small pours on bigger jobs.

Ask your Maginniss distributor to show you how the Uni-lectric fits your operation—he'll be glad to demonstrate.

MAGINNISS
UNI-LECTRIC
CONCRETE VIBRATORS

MAGINNISS
POWER TOOL COMPANY

154 Distl Avenue • Mansfield, Ohio

SAVE MONEY
when pouring concrete
RENT ECONOMY
STEEL FORMS

• Easily and quickly assembled
• Complete supervisory service
• Adaptable to wide use
• Save time and material
• Other forms available on a purchase basis

Write for catalog to
ECONOMY FORMS CORP.
HOME OFFICE • DES MOINES, IOWA

DISTRICT SALES OFFICES: St. Louis, Mo. • Kansas City, Mo. • Lincoln, Neb. • Minneapolis, Minn. • Ft. Wayne, Ind. • Milwaukee, Wis. • Cincinnati, Ohio • Cleveland, Ohio • Metuchen, N. J. • Rochester, N. Y. • Springfield, Mass. • Washington, D. C. • Decatur, Ga. • Dallas, Texas • Los Angeles, Calif. • Oakland, Calif. • Denver, Colo.

For more facts, circle No. 403
CONTRACTORS AND ENGINEERS

Designed especially for digging narrow canals, this Ellicott dredge 11 x 3 x 28 feet, is operated by one man as it works on a new canal that will provide drainage for Baltimore's Friendship International Airport.



water by a crane.

Completely hydraulically controlled, the dredge has all its movable parts operated from a single control panel so that only one operator is needed. In moving from the launching site to the starting place of operations, the dredge used a basic principle of jet propulsion. While the pipe lay in the water, the pump ejected water from the discharge pipe at the stern with a force sufficient to move the dredge. This self-propulsion diminished the need for auxiliary moving equipment. The discharge pipe was attached so that it could function as a rudder and change the direction of the dredge as it floated to the work area.

Ladder assembly

The swinging ladder hinged to the bow moves up and down and from side to side. In most conventional dredges, the ladder assembly is limited to a vertical movement, and the entire dredge has to swing laterally to make the arc of the cut. This operation requires a wide space since the dredge must have room enough to maneuver. But the free-swinging ladder of the canal dredge allows the hull to remain stationary in a narrow canal while the chewing and sucking action of the cutter head and suction pipe goes on as just the ladder moves from one side of the ditch to the other. Positive control of the ladder movement insures an accurate cross section and smooth canal contour.

Another featured innovation of the dredge is its four spuds instead of the usual two. The spuds, long steel devices used to advance and swing the dredge, increase the unit's maneuverability and stability.

Capable of digging to a depth of 8 feet, the dredge cut through several earth strata varying in degrees of density from sticky morass of decayed vegetation silt to light sand, gravel, and a hard clay-like gumbo. Its rate of output was high—100 cubic yards of silt per hour; 80 cubic yards of light sand per hour; and 65 cubic yards of gravel and clay per hour.

Now that the ditch has been opened, drainage of the entire vicinity will be done at a faster rate, and the dangers of flooded runways at Friendship Airport will be greatly reduced.

Local residents of the Glen Burnie area will also profit, since the danger of the swamp land in the neighborhood will be eliminated. **THE END**

For more facts, circle No. 404→

On highway construction, road maintenance, ditching, terracing, finish grading, spreading road mix, land leveling, Adams 660 gives you the extra power, speed, and stamina to do all of these jobs faster, better, and at lowest cost.

*Here's
Why*

**you should check the ADAMS 660
against your present heavy-duty graders**



A lot has happened to the BIG grader field in the last year or two. For instance, if you have one of the 115 hp competitive graders that were "BIG" a few years ago, Adams 660 can now give you...

1. 30% more horsepower for deeper cuts, harder materials, faster cycles.
2. 29% more weight on drive wheels to apply more power, get more work done faster.
3. 35% higher travel speed to cut non-productive time between work assignments.
4. 117% higher reverse speed for more cycles per hour on shuttle grading.
5. 33% extra forward-speed-selection of power to match your load. With optional creeper gears, 83% extra choice in geared speeds (1/4 to 26

mph) for increased accuracy and more effective application of power to difficult work.

6. 100% additional backing-speed selection that cuts waste time on return cycles, improves production on back-up grading.
7. 19% more front-axle clearance to work larger windrows and come in and out of ditches without interference.

In addition, all gears in the "660" constant-mesh transmission are on anti-friction bearings for easy operation, less wear, less maintenance cost. Adams rubber-mounting of engine keeps vibration from traveling to machine and operator. Automatic braking of "660" transmission, when applying hydraulic brakes to wheels, gives you safer operation with less wear on brake linings,

and less pedal effort. Because "660" power-box clutches shift on ball bearings, you have less wear...easier, smoother-operating controls.

It's a good time now to review your grader equipment, a good year to make needed replacements before the big rush comes to fill needs of the huge expansion in new federal-financed highway construction. We'll be glad to help you make a fair and realistic analysis of your grader equipment and grader needs. We'll be glad to give you every opportunity to compare the Adams 660...or smaller models...with your present equipment or with any competitive grader.

Wouldn't now be a good time to talk it over? We can give you better deliveries and better deals now than we can later on...that is, if we can prove to you that we have the best grader for your work, and if you decide that now is the time for you to buy.



Multiply the uses of your Adams grader with optional equipment: Scarifier, for ripping old asphalt and hard-packed surfaces; Bulldozer, for pushing debris from grade, backfilling

around culverts, etc.; "V" Snow Plow and Wing, for cleaning highways and country roads of snow and ice; and Elegrader, for plowing and loading, or sidecasting materials.

A size ADAMS for every need

- Model 660—150 hp diesel engine, 27,730 lbs.
- Model 550—123 hp diesel engine, 23,500 lbs.
- Model 440—104 hp diesel engine, 21,500 lbs.
- Model 330—80 hp diesel engine, 20,500 lbs.

Traveloader—A high-speed, heavy-duty, self-propelled, belt-type loader for picking up materials and loading into trucks from windrows or stockpiles, 55 hp gasoline or 60 hp diesel engine, 16,800 lbs. AG-29-G-b



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



37TH ANNUAL MEETING
 ASSOCIATED EQUIPMENT DISTRIBUTORS
 The Conrad Hilton — Chicago — January 29-February 2, 1966
 PHOTOGRAPH BY CONTRACTORS AND ENGINEERS MAGAZINE
 DONALD V. HUTTENBACH, PUBLISHER

distributor doings

Distributors

As certainly as 1956 promises to be another record year for construction activity, the year holds promise of new records in sales of construction equipment. And equipment dealers have indicated they are ready to absorb this additional volume of business with no sacrifice in either service or profits.

Upwards of 2,500 strong, these mid-dlemen of the nation's greatest industry gathered recently to view their common situation and tackle their common problems. Five days of down-to-earth sessions left them armed with new aids both for serving their customers and for earning a "normal margin" of profit.

The occasion for this business brush-up was the 37th annual meeting of the Associated Equipment Distributors, held January 29 through February 2 in Chicago. Dealers from all 48 states, U. S. territories, and Canada—plus their manufacturer guests—virtually took over the Conrad Hilton Hotel for the five-day program.

Two major projects—one embodied in a resolution and the other drawn from the preamble to the association's constitution—for the ensuing year were pinpointed by new president Stanley F. Laskey, president of North-



S. F. Laskey, president

western Equipment, Inc., Fargo, N. Dak., at the installation luncheon.

The resolution called for concerted effort on the part of AED members individually and collectively to promote and speed into reality the proposed federal road program. Earlier in the meeting, a prominent Washington news analyst had told the assembled dealers that a pay-as-you-go federal highway aid program was a "good bet" for passage this year.

Reminding the members that, according to the AED constitution, they are entitled to seek "the normal reward of business . . . namely, a fair profit margin . . ." and reporting that an association survey indicated the average member is earning "far less" than this normal margin, president Laskey said the year's second major project would be to educate the membership to better business management.

New Officers

New president Laskey succeeds RAY J. Finn of the Bode-Finn Co., Cincinnati, Ohio. Others elected and in-

CONTRACTORS AND ENGINEERS

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president
of North-

Re-elected to two-year terms as
directors were John G. Lindner, Jr.,
Bark River Culvert & Equipment Co.,
Eau Claire, Wis., Region 7, and Beal
Shaw, Shaw Sales & Service Co., Los
Angeles, Calif., Region 2.

New directors chosen last Decem-
ber and installed at the convention
are Leonard Morrissey, Morrissey
Bros. Tractor Co., Burlington, Mass.,
Region 1; Harold W. Reilly, Service
Supply Corp., Philadelphia, Pa., Re-
gion 3; Jack F. Davies, Tractor &
Equipment Co., Inc., Birmingham,
Ala., Region 5; John C. Anderson,
Anderson Equipment, Inc., Omaha,
Nebr., Region 9; Harold B. Benson,
Road Builders Equipment Co., Mem-
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president Campbell, Region 15; and
Charles C. Tambornino, George L.
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Angeles, Calif., Region 2.

MARCH, 1956

H. D. Ander-
son, Rish Equip-
ment Co., Blue-
field, W. Va.,
as seen by the
cartoonist.



Regions 2, 4, 6, 10, 12, and 14 did
not elect directors this year.

As usual, the convention program
included formal business and educa-
tional sessions, entertainment, and a
generous amount of informal discus-
sion both among members and be-
tween the dealers and their more
than 300 manufacturer guests. The
latter greeted the AED members at a

special "Meet Your Manufacturer"
session the opening day of the meet-
ing, and then were invited to sit in
on several sessions during the re-
mainder of the convention.

Although it was a full program,
unanimous choice as highlights were
the morning sessions when the dealers
sat down together and discussed busi-
ness—including mutual and some-
time thorny problems. Topics which
received special consideration in-
cluded the cost of doing business,
trade-ins and used-equipment sales,
salesman compensation, distributor-
manufacturer relations, and customer
relations.

The highway picture

Speaking at the welcoming lunch-
eon, Theodore F. Koop, CBS director

of news and public affairs at Wash-
ington, reviewed both the need for
and the history thus far of proposed



W. A. Patterson, Richards
Equipment Co., Waco,
Texas.

federal highway-improvement legis-
lation. Bringing the picture up to the
present time, he declared:

"We can be reasonably sure that

stalled include the following:

L. Miner Doolen, Telford Equipment
Co., Lansing, Mich., executive vice
president; H. D. Anderson, Rish
Equipment Co., Bluefield, W. Va., vice
president for a second term; F. J.
Fitzpatrick, Parker-Danner Co., Hyde

H. D. Anderson,
vice president



Park, Mass., vice president; D. C.
Campbell, Tractors & Equipment,
Ltd., Fredericton, New Brunswick,
Canadian vice president; John R.
Borchert, Borchert-Ingersoll, Inc.,
St. Paul, Minn., treasurer.



J. R. Borchert, treasurer & F. J. Fitz-
patrick, vice president, respectively.

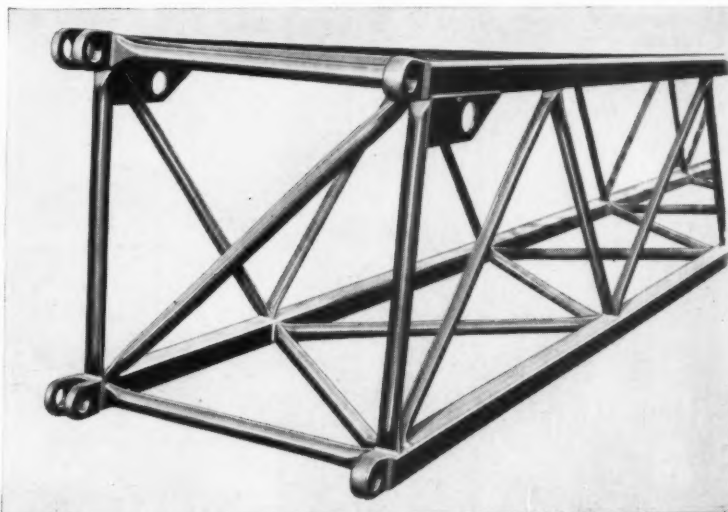
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phis, Tenn., Region 13; Canadian vice
president Campbell, Region 15; and
Charles C. Tambornino, George L.
Ryan Co., Minneapolis, Minn., Re-
gion 8.

NEW LORAIN CRANE BOOM

Square Tubular Chords . . . Tubular Lacing . . . Increased Capacities with Less Weight, More Strength

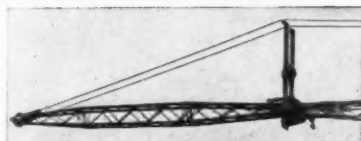
Thew-Lorain Crane Boom Design Increases Lifting Capacities . . . Permits
Handling and Traveling with Longer Booms . . . Other New Crane Boom
Features Provide Ease of Assembly Plus Total Lengths to 150 Feet*



Here's a brand new Crane Boom de-
sign that reduces boom weight 20
to 30%. Lighter, yet stronger, you
can now put this weight saving to
work for you in increased lifting ca-
pacities. The new Lorain "Square
Tubular" Crane Boom is based on a
new material and design idea. De-
parting from the conventional angle
or tube construction, Thew-Lorain
has selected square tubular mem-
bers for the main chords of the
boom. These are laced together with

continuous lengths of round tubular
lacing, preformed and welded to the
square chords. The method of fab-
ricating the lacing to the chords
requires less lacing, saving weight,
yet gives the same high torsional
resistance and columnar strength as
obtained by "banding" the boom.
This revolutionary, new crane boom
design is available as standard
equipment on Lorain 8, 10 and 25-
ton crawler cranes and 10, 22½, 25
and 30-ton rubber-tire cranes.

*2-PIECE TIP EXTENSION



The same principle of square tubu-
lar main chords, as used in the main
boom, has been applied to the Tip
Extension to give maximum lifting
capacities at minimum weight. Tip
extensions are made in 2 pieces,
with suitable center sections, to per-
mit varying overall length to meet
job needs. For instance, on Lorain's
30-ton Moto-Crane, 150 ft. of boom
including tip extension may be used.
Tip extension may be used as
straight or gooseneck extensions.

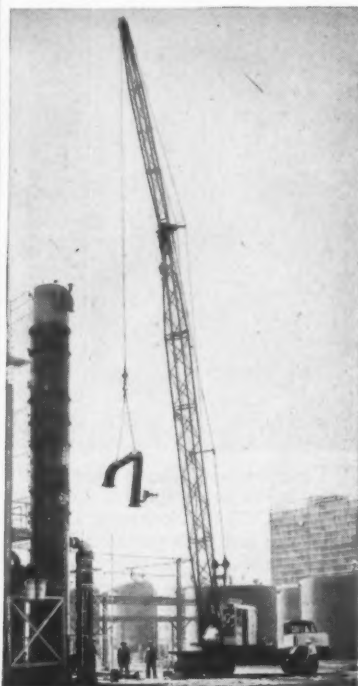
TILTING MAST-TYPE GANTRY

Recommended for use with all long
booms . . . (1) for easier raising of
booms from flat positions, and (2) to
reduce stresses in long booms, pend-
ents and cables while operating. Fab-
ricated of square tubes, Gantry is
hinge-pin connected to the Boom
base and may be lowered for travel,
or easily removed.

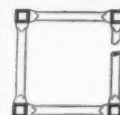


HANDLE LONGER BOOMS

The new, "Square Tubular" Crane
Boom design, with greater strength
at reduced weight, permits (1) in-
creased lifting capacities, (2) raising
longer booms from flat position, (3)
traveling with longer booms over the
rear. Crane sections are equipped
with "erecting lugs" for ease in as-
sembling long booms.



This shows a cross-section of
the new "Square Tubular"
Crane Boom design on which
Thew has applied for a patent
on the construction of this
equipment and the method of
fabricating it.



3-SHEAVE
BOOM HEAD

This 3-sheave Boom Head permits
reeving 6 parts of hoist line without
the use of a top block and the result-
ing loss of vertical working range.
Boom Heads are designed for ready
installation of tip extensions or pile
driver leads.

THE THEW SHOVEL CO.
Lorain, Ohio



Beal Shaw, Shaw Sales & Service Co., Los Angeles, Calif., re-elected director of Region 2.

the House will pass and Congress will finally enact a highway-aid program this year. This cannot yet be called a certainty, but it is a good bet. Under such legislation we can assume that the federal government will pay 90 per cent of the cost of modernizing

the Interstate Highway System, with the states paying the remaining 10 per cent. We can assume, too, that a bond issue is dead. Instead, it will be a pay-as-you-go program, with some sort of higher taxes on motor fuel and tires."

The speaker said that the Fallon bill



Henry Askew, Askew Equipment Co., San Antonio, Texas.

(submitted by Maryland Democrat George Fallon last year and defeated in the final days of the legislative session) is the bill marked for House consideration. The Maryland solon's bill has been revised to provide for federal grants of nearly 25 billion dollars over the next 13 years for modernizing and expanding the Interstate Highway System. This figure would constitute 90 per cent of the necessary funds, and states would supply the remaining 10 per cent, Mr. Koop explained.

Distributors and manufacturers alike were guests at an Early Birds breakfast, honoring retiring president Finn, which preceded the opening business session. Guest speaker was George C. Koss of Koss Construction Co., Des Moines, Iowa, president of



Ross Hysom, Hedge & Mattheis Co., Boston, Mass.

the Associated General Contractors of America. His topic was Construction's 1956 Responsibilities.

Touching briefly on the recent construction activity predicted for this year, Mr. Koss said the responsibility of the industry this year is the same as in years past: to provide a physical plant for the needs of the people. He then went on to discuss the role of the equipment distributor in this undertaking.

"... the members of your industry have made it possible for the construction industry to increase the productivity of its men. . . . You members of the Associated Equipment Distributors are an essential part of the construction industry; (it) could not survive without you," the AGC officer stated. He also assured the dealers that members of his organization understand and are sympathetic to many of the problems involved in operating a distributorship.

The annual membership report, submitted at the opening business session, revealed that with applications now being processed the AED roster stands at more than 1,200 distributor and manufacturing firms—the largest enrollment in the organization's history. Morton R. Hunter, Sr., of Hunter Tractor & Equipment Co., Milwaukee, Wis., represented 37 dealer firms who were honored for

Deliver More Material With Fewer Trips to BARBER-GREENE Paving Finishers With HOBBS Schonrock Cable Dump TRAILERS



HSCDA-9-55

Your Barber-Greene paving finisher works more with fewer interruptions when you use big double-load HOBBS Schonrock Cable Dump TRAILERS. The paving finisher has less idle time because fewer truck refills are necessary.

New rear-end modifications (as shown in the lower photo) keep materials IN the hopper. Construction permits use of tail gate chain, so the flow of material may be properly controlled.

Hauling contractors in all sections are multiplying the work of their trucks by converting to HOBBS Schonrock Cable Dump TRAILERS. Equipped with a HOBBS Schonrock Cable Dump TRAILER one truck can do the work of two, three, and sometimes four conventionally equipped dump-body trucks. In this way you take full advantage of greater gross load capacities in accordance with state bridge formula laws. This naturally means greater net operating profits.

HOBBS Schonrock Cable Dump TRAILERS are available in single and tandem axle models.

Write, Wire or Call for Complete details. For your convenience use this Coupon.

HOBBS TRAILERS

609 NORTH MAIN FORTH WORTH, TEXAS

SALES AND SERVICE IN 38 STATES & MAJOR CITIES DISTRIBUTORSHIPS AVAILABLE IN SOME AREAS

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 406

Less Waiting for Truck Refills
No Overflow to Shovel Up
Reduced Operating Costs



HOBBS TRAILERS, DEPT. R.
609 NORTH MAIN, FORTH WORTH, TEXAS
Please send details about HOBBS Schonrock Cable Dump TRAILERS.

NAME
FIRM
ADDRESS
CITY

RUNNING SAND TO

SOLID SOIL

IN MINUTES WITH

chemject

Water seeping through walls?
Excavating through running sand?

By injecting chemicals into the soil behind tunnel or basement walls, the soil can be rendered impervious and leakage stopped.

By injecting chemicals into sand in advance of excavation, tunneling and caisson digging operations can be simplified and progress improved.

Chemject engineers and chemists are available for consultation to discuss your job.

• Trade Mark

Chemject Corporation
3533 N. Cicero Ave., Chicago 41, Ill.

For more facts, circle No. 407

CONTRACTORS AND ENGINEERS



Edward C. Flaherty, The Edward C. Flaherty Co., Long Island City, N. Y.

25 years' or more membership in the organization.

Cost of doing business

Figures which pointed up the need for greater emphasis on the profit margin problem were given during a report on a recent AED cost-of-doing-business survey. With 251 firms (36 per cent of the membership) reporting, the survey revealed that the average gross profit for a dealer's business year is 20.81 per cent. Variations of two or three points over or under that figure were said to be due



R. C. Linder, A. E. Hudson Co., Morton, Ill.

mainly to transactions involving trade-ins.

The survey showed that, after deduction of operating costs, the average net profit was 2.55 per cent.

One of the program highlights of the five-day meeting was a How-To-Do-It discussion in which dealers participated in separate groups of ten. Such questions as division of territory among salesmen, salesman compensation, methods of compensating salesmen when trade-ins are involved, advantages or disadvantages of handling a large number of lines, achieving a better profit ratio, and disposal of new equipment were discussed at separate tables, and the results summarized and then reported to the entire assembly.

In this session, the members themselves got down to business and tackled the problems that beset dealers everywhere. Solutions to the problems were varied, with spokesmen for the separate discussion tables reporting unusual procedures brought to light during the discussions. All ideas which the discussions brought out will be tabulated, summarized, and reported in some form to the entire membership by the association's central office.

Another popular program feature was a mock courtroom scene, staged by the AED's Industry Round Table, during which a dealer, a manufacturer, a customer, and various witnesses aired problems and conflicts which arise in dealer-manufacturer and dealer-customer relations. While professional actors took major roles,

dealers and manufacturers formed a court of judges and acted as witnesses.

The skit served to criticize, in constructive fashion, both the dealer and the manufacturer where each could be at fault in his handling of business operations.

A third program was devoted entirely to the salesman's wife and her role in her husband's efforts to achieve success. The Research Institute of America conducted the program, presenting charts, skits, and short talks by experts from its organization to demonstrate points.

Throughout the convention, clinics and committee meetings were held to explore specific projects undertaken by the association to help its membership. Distributor-manufacturer con-

ferences also were held each day.

The annual birthday party honoring the retiring president was the highlight of a social program worked into the busy conference schedule.

THE END



New Bil-Jax distributor

Lee Equipment Corp., 33 Island St., Boston, Mass., has been appointed New England distributor for Bil-Jax, Inc., Archbold, Ohio. The Lee firm will handle sales and service on the Bil-Jax line of tubular steel scaffolding in all of the New England states.

Syntron sales changes

Three of the sales companies handling vibratory equipment, power tools, conveyors, rectifiers, and other equipment manufactured by the Syntron Co., Homer City, Pa., have made changes in their sales organizations.

Syntron Pittsburgh Sales Co., has named Robert Wetling to the staff to handle resale accounts in Allegheny

How to beat a fleet of limited-duty rigs ... WITH ONE International Drott 4-IN-1



Beat a power shovel wherever exclusive Drott triple-power, pry-action break-out is decisive—and where quick International crawler mobility can out-speed and "out-reach" a boom. Break-out force of the three Four-In-One models as Skid-Shovels ranges from 8,500 to 17,000 lbs!



Gain a 30-inch (or greater) dumping height advantage over ordinary roll-forward bucket dumping—by using the bottom-dump feature of the Four-In-One as a clamshell. And loading with the clamshell action, get a super-fast bucket-fill on stockpiled materials, even in cramped quarters.



Get versatile carry-type scraper action with the Four-In-One in Bullclam position. Using positive clam lip control, spread materials, strip, and grade with amazing accuracy. And as a Bullclam, the Four-In-One heap-loads itself with speedy, earth-boiling action!



Get big dozing capacity with finger-tip ease with your Four-In-One in bulldozer position. Regulate dozing depth by hydraulic "radius control" of blade pitch. Note the frost-breaking, earth-moving action. Shown here is new 2 1/4-yard Four-In-One for the International TD-14.



Prove Four-In-One versatility unlimited with the 1-yard TD-6, the 1 1/2-yard TD-9, or the new 2 1/4-yard TD-14 model. Test exclusive pry-over-shoe break-out action, and exclusive shock-swallowing Hydro-Spring. Ask your International Drott distributor for a Four-In-One demonstration.



International Harvester Company, Chicago 1, Illinois

INTERNATIONAL DROTT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 408

distributor doings

and Beaver counties in Pennsylvania. Edward F. Pierson has joined Syntro Boston Sales Co.

Syntro Central Pennsylvania Sales Co., formerly located at Indiana, Pa., has moved to Bellefonte, Pa., with Frank Belleteri handling sales in that territory. James Meehan, recently appointed to the Central Pennsylvania staff, will be in charge of accounts in the Johnstown area.

Detroit Diesel names new dealer in Michigan

Peninsular Diesel, Inc., has been appointed a distributor of industrial

diesel engines by the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich. A newly organized firm, Peninsular will service the lower peninsula of Michigan from its headquarters at 6565 W. Warren Avenue.

Clark F. Andrea is president of the organization, and M. W. Bever is secretary-treasurer.

Euclid appoints dealer for Canadian province

Tobin Tractor Co., 655 Albert St., Regina, Saskatchewan, Canada, has been authorized as a dealer of scrapers, rear and bottom-dump hauling units, and crawler tractors made by the Euclid Division of General Motors Corp., Cleveland, Ohio. The company

will handle parts, sales, and service for the entire province.

W. R. Tobin is president of the firm.

New firm acquires Stephens Equipment

The assets of the Stephens Equipment Co., Des Moines, Iowa, have been purchased by a newly organized firm, the Mainline Equipment Co., Inc. The new company, also operating in Des Moines, will continue as a distributor of engines and other construction and industrial equipment manufactured by the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich.

R. V. Hicklin, formerly with Stephens, heads the new organization.

Pioneer names distributor

Wepco Equipment Co., 3421 Independence Road, Cleveland, Ohio, has been named a distributor for Pioneer Engineering Works, Minneapolis, Minn., a subsidiary of Poor & Co.

The new dealer will cover the entire state of Ohio.

Marion Power Shovel names two distributors

Knight Equipment Co., 1760 Kelly Road, Richmond, Va., has been appointed distributor for central and western Virginia by the Marion Power Shovel Co. The new dealer will handle Marion's line of crawler and rubber-mounted excavators and will



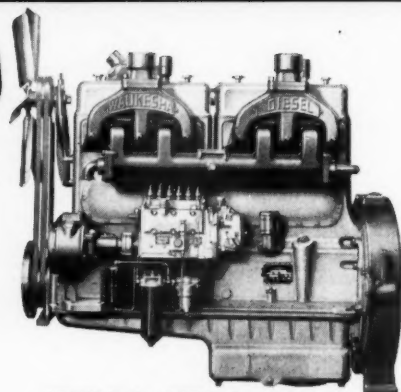
Morauer & Hartzell, Inc., Washington, D. C., used Waukesha Diesel powered Lorain shovels on New York Thru-Way.

...and big jobs everywhere with

WAUKESHA

Diesels!

- easy to start
- quick to warm up
- snappy acceleration
- big reserve of power
- high fuel economy
- most economical upkeep



WAKD Series DIESEL—6-cyl., 6 1/4-in. x 6 1/2-in., 1197 cubic inch displacement.

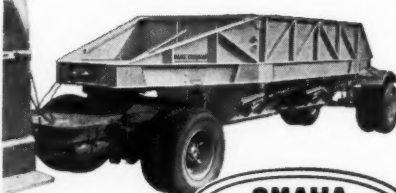
• Diesels for super duty—that keep on putting out the power! Patented Waukesha combustion chamber controls combustion to meet the needs of the job. • Advanced design features include hardened 7-bearing crankshaft...torsional vibration dampener...heavy-duty aluminum alloy pistons, oil cooled, with chrome plated top piston rings...special alloy wet cylinder sleeves...Stellite faced valves and valve seat inserts...built-in oil cooler...thermostatic water temperature control. Send for Bulletin 1415.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES



Haul Larger Legal Payloads

FASTER . . .
EASIER . . .
CHEAPER . . .



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CENTER DUMP TRAILER!

Lower initial cost—less maintenance—faster unloading time—increased payloads. Put an Omaha Standard Center Dump Trailer on the job, and let gravity do the work.

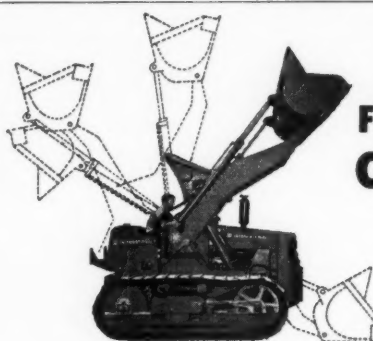
Throughout the United States and Canada, hundreds of contractors are using Omaha Standard Center Dump Trailers for hauling, dumping, spreading and stockpiling all types of flowing materials;—dirt, gravel, shale, rock, sand, chemicals, cement, etc. And they find that it quickly pays for itself.

The Omaha Standard Center Dump Trailer is designed and built to give you greater production at less cost—conforms with all state bridge and axle laws. Illustration shows 10-yd. trailer. Built in all yardages, for any material, single or tandem, for on or off highway. Also available with cross-flow hoppers for spreading. Tell us your problem. Write now for full information.

OMAHA STANDARD

FACTORY AND GENERAL OFFICES
2401 W. Broadway
COUNCIL BLUFFS, IOWA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 410



NOW
OVERHEAD PLUS
FRONT-END LOADING
COSTS NO MORE

with



This versatile combination overhead and front-end loader costs no more than conventional front-end loaders...yet loads more dirt, faster with your International T-9 or TD-9 than any other loader on the market today!

ONLY LODOVER GIVES YOU

- 50% MORE YARDAGE—no-turn overhead operation eliminates two turns every cycle, doubles yardage every hour
- EXTRA DIGGING POWER—twenty-five degree bucket tilt-back at ground level pries out a full bucket every time
- REDUCED TRACTOR MAINTENANCE • SAFE, EASY HYDRAULIC OPERATION • HIGH-SPEED FRONT-END LOADING

- A complete line of job-tested attachments makes Lodoover the most versatile multi-purpose unit you can buy to boost profits on your job. An on-the-job Lodoover demonstration will convince you...arrange for one today!

SERVICE SUPPLY CORPORATION
20TH & ERIE AVENUE • PHILADELPHIA, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 411

CONTRACTORS AND ENGINEERS

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maintain equipment parts warehouses and full service facilities. Rental equipment will also be available.

In Kansas City, Mo., Machinery & Supplies Co., Inc., will handle the line of crawler and rubber-mounted excavators for the western part of Missouri and for all of Kansas. Headquarters for this distributor are at 2000 Walnut Street.

Anderson names Greer to top equipment post

The W. H. Anderson Co., Inc., Detroit, Mich., distributor of construction and industrial equipment, has

Leslie Greer, recently appointed equipment superintendent for the W. H. Anderson Co., Inc.



appointed Leslie Greer equipment superintendent.

With the firm since 1925, when he started as a mechanic, Mr. Greer has held the position of shop superintendent for the past 20 years. In his new position, he will be responsible for the sales and rental of earthmoving equipment. He will concentrate his activities in Michigan and Ohio.

Five new distributors for Wright Power Saw

The Wright Power Saw Division of Thomas Industries, Inc., Sheboygan, Wis., has named five new distributors of its gasoline-powered saw.

The new dealers and the territories they will cover are: Turner Mfg. Co., Statesville, N. C., covering Georgia and West Virginia; Tri-State Distributors, Statesville, N. C., for South Carolina; Frank J. Zorc & Sons, Roseland, Fla., the entire state of Florida; Kentucky - Tennessee Distributors, Lexington, Ky., for Kentucky and eastern Tennessee; and Foulis Engineering Sales Ltd., Halifax, Nova Scotia, for that entire province.

New Prime-Mover dealer

The Prime-Mover Co., Muscatine, Iowa, has appointed the Nixon Machinery & Supply Co., Chattanooga and Knoxville, Tenn., exclusive distributors of power carts in the eastern Tennessee area.

Concrete finishing

A new pamphlet from Stow Mfg. Co., "Grinding Concrete," contains information on proper speeds for wet rubbing and dry grinding concrete. Information on the best types of new disks for each job is given. Included is data on the right speed for dry or wet angle heads for use on the firm's flexible shaft grinders and vibrators.

To obtain this pamphlet write to Stow Mfg. Co., 443 State St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 18.

For more facts, circle No. 412-

MARCH, 1956

Marion Power Shovel names sales managers

Two new divisional sales managers have been appointed by the Marion Power Shovel Co., Marion, Ohio, manufacturer of crawler and rubber-mounted excavators.

Lawrence E. Schaffer will head the company's central sales area, with offices at 2245 Nottingham Road, Columbus, Ohio. He will be responsible for the sale of clutch-type machines in the entire state of Ohio and

for the sale of large machines in the western part of the state.

Directing the sales of all Marion products in Delaware, southern New Jersey, and eastern Pennsylvania is George L. Moritz. He will maintain offices at 105 Spruce St., Emmaus, Pa.

Caterpillar to build new plant in Glasgow

A new plant for manufacturing D4 and D8 tractors will be built in Glasgow, Scotland by Caterpillar Tractor Co., Ltd., of Great Britain. A sub-

sidary of the Caterpillar Tractor Co., Peoria, Ill., the firm expects the plant to be producing by 1958.

Development of the Scottish manufacturing project will be under the direction of James R. Munro, who will be assisted by American officials and technical experts from Caterpillar.

Warehousing and distribution activities, now centered on the outskirts of Leicester City, will also be expanded.

Remember—safety is no accident! The life you save may be your own.

HOW THE CAT* No. 12 MOTOR GRADER HELPED CUT COSTS on the Garden State Parkway



Last year New Jersey's fine four-lane Garden State Parkway went in from Cape May to Paramus. Along one section of this big job the haul roads ran a mile and a half from borrow pit to fill—and the fill was 100% sand. It took continuous grading to keep the fill compacted, and Public Constructors, Inc., of Pleasantville, N. J., relied on four Cat No. 12 Motor Graders to do the job, as well as to keep the haul roads in shape.

"What would a contractor do without Caterpillar when there's an earthmoving job to be done?" wonders Supt. John W. Franks. Mr. Franks likes lots of things about the No. 12—mostly its low-cost features. And the new improved No. 12 offers greater low-cost advantages than ever.

Costs less to maintain. There's extra life built into every part of the Cat No. 12. The new exclusive Caterpillar Oil Clutch, for example, practically eliminates disc replacement and reduces down time considerably.

Costs less to operate. Just one reason among many: the heavy-duty 115 HP engine delivers efficient power on low-cost non-premium fuels.

Produces more. Positive controls; easy, natural steering that maintains "feel of the road"; clear visibility; fast, accurate blade positioning—features like these add up to maximum operator comfort and convenience, higher production on any job.

AND NOW, ANOTHER NEW COST-SAVING FEATURE: New tubeless tires do away with expensive tube and flap trouble, eliminate costly tube replacement and can cut over-all tire down time by 80%!

No wonder Supt. Franks says, "To us, Caterpillar is the old reliable, always out in front with new designs that assure you not only the latest, but the best."

See your Caterpillar Dealer for full details on the high-producing, cost-cutting Cat No. 12 Motor Grader. There's nothing else like it available—anywhere.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

99% OF ALL CAT
MOTOR GRADERS EVER
BUILT ARE STILL AT WORK

AGC takes stock

as 60-billion-dollar work volume looms

The nation's contractors last month reiterated their solid support of proposed federal highway legislation, but went on firm record as opposing the inclusion of any wage-fixing clause in such a bill.

The outlook for construction during 1956—brightest, incidentally, in the industry's history—and the means by which its members can profitably meet the challenge of a 60-billion-dollar construction program were major topics for discussion at the 37th annual meeting of the Associated General Contractors of America, held February 13 through 16 in New York City.

More than 1,600 contractors from all parts of the country gathered at the Waldorf-Astoria Hotel for the four-day convention. Speakers included, besides association officials and other key members of the industry, important representatives of the manufacturing industry, governmental agencies in charge of federal construction, and labor organizations.

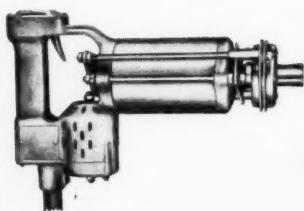
Speakers whose messages proved of particular interest to the assembled contractors included:

Horace A. Sawyer, president of the Lone Star Cement Corp., who told the Association that there is no cement shortage, that, in fact, "the

POWER TOOLS That Pay For Themselves

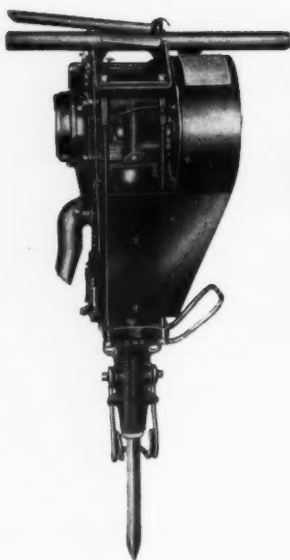
— On Job After Job

SYNTRON



"Electric" HAMMER DRILLS and HAMMERS

Automatic, self-rotating Hammer Drills that cut through concrete ten times faster than by hand. Electromagnetic operation — practically no maintenance. Electric Hammers for low cost cutting, chipping, pointing, scaling, etc.

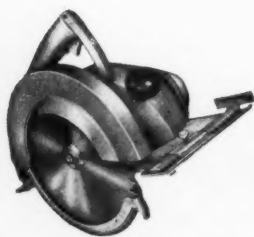


GASOLINE HAMMERS PAVING BREAKERS ROCK DRILLS

Require no air compressor or accessories. Deliver 2000 powerful blows per minute for busting concrete, digging clay and shale and tamping backfill. Drill steel rotates automatically for drilling.

CONCRETE VIBRATORS

Electromagnetic models that clamp directly to sides of wall forms for high speed settling on form jobs. Gasoline or electric models for mass vibration.



ELECTRIC SAWS

Rugged, powerful saws for cross-cutting or ripping hard or soft wood at top speed without bucking or pulling. Used for production cutting of concrete block, plaster board, etc. Two Models with 8" or 10" blades—2-13/16" and 3-1/4" cuts.

Write today for complete tool catalogue - FREE

SYNTRON COMPANY
227 Lexington Ave. Homer City, Pa.

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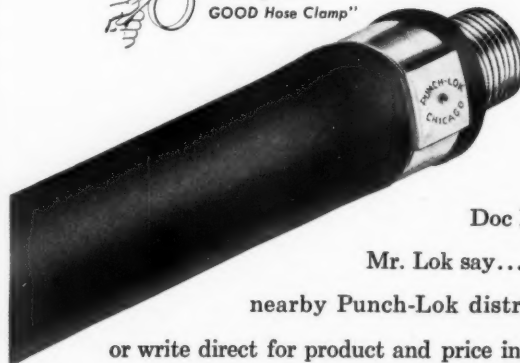
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with PUNCH-LOK Hose Clamps



"The Sign of a GOOD Hose Clamp"



Doc Punch and Mr. Lok say... "See your nearby Punch-Lok distributor"—or write direct for product and price information.

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Rear Adm. Robert H. Meade, chief, Bureau of Yards and Docks.



C. D. Curtiss, commissioner, Bureau of Public Roads.



Maj. Gen. Lee B. Washbourne, assistant chief of staff for installations, Department of the Air Force.



Lt. Gen. Samuel D. Sturgis, Jr., chief of engineers, Department of the Army.

postwar increase in the production of portland cement has out-stripped that of all other basic production materials";

Walker L. Cisler, president of the Detroit Edison Co., who declared that "the role of the construction industry in the development of atomic power will be most important";

Lt. Gen. S. D. Sturgis, Jr., chief of engineers, Department of the Army,

who stated that "the military construction program launched in 1950 is still more than a billion dollars away from completion, and there is a constant net increase in our requirements each year";

Maj. Gen. Lee B. Washbourne, assistant chief of staff for installations, Department of the Air Force, who pointed out that "development of new military armaments and other tech-

nological advances will probably continue the air force construction program at its present magnitude for the next three to five years";

Maurice A. Hutcheson, general president of the United Brotherhood of Carpenters and Joiners of America, who assured the contractors that "the American labor movement in 1956 will not allow itself to be jockeyed into a position where it hangs

on the coattails of any single political party".

Business highlights

Among the important business handled during the meeting was the installation of Frank J. Rooney, president of Frank J. Rooney, Inc., Miami, Fla., as AGC president for 1956. He succeeds George C. Koss, president of Koss Construction Co.,

POSEY SPECIALIZES IN DREDGE PIPE AND FITTINGS



- Shore Pipe
- Pontoon Pipe
- Pontoon Cylinders
- Hull Pipe
- Ladder Suction Pipe
- Spuds
- Ladders
- "Y" Valves
- Gate Valves
- Hulls
- Pump Liners
- Ball Joints

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ELEVATED TANKS • HORIZONTAL TANKS • STACKS • PRESSURE VESSELS • DIGESTERS
DREDGE PIPE AND ACCESSORIES • CARBON AND ALLOY STEEL PLATE FABRICATION

POSEY IRON WORKS, INC.

STEEL PLATE DIVISION • LANCASTER, PENNA.

NEW YORK OFFICE: GRAYBAR BLDG.

Yes, an OWEN BUCKET swung from any crane boom will always give you:

FASTER Penetrating ACTION
when handling aggregate and loose materials;

FASTER Digging ACTION
with variable, multiplied closing power for excavation;

FASTER Loading ACTION
by reason of correctly engineered bowl designs with balanced power on each jaw;

FASTER Discharge ACTION
The combination of adjustable reeving and weight concentration in area surrounding lower sheave block exerting a direct pull on the cable, results in quicker opening and faster dumping.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 415

For more facts, use Reader-Reply Card opposite page 18 and circle No. 416

Des Moines, Iowa.

The emphasis given to contractor-labor and contractor-supplier relations in the business sessions was manifested in three of the seven resolutions adopted unanimously by the contractors. Of these, two dealt with labor and one with suppliers of construction materials.

Besides going on record as opposing the inclusion of the Davis-Bacon Act or any other wage-fixing clause in federal highway legislation, the assembly passed a resolution urging members of chapters of the AGC to cooperate with other employer organizations in seeking a solution to labor problems.

Considerable discussion of the matter in both general and divisional



Frank J. Rooney, Miami, new AGC president.

sessions led to adoption of a resolution calling on manufacturers to do away with escalator-price clauses in their contracts with construction firms and urging public agencies who award contracts to oppose these clauses in contracts.

As usual, the convention devoted the majority of its schedule to general business sessions, but one entire day was given over to separate meetings

of the building contractors', highway contractors', and heavy construction and railroad contractors' divisions. Studies and other projects, as well as the problems peculiar to the group, were discussed.

Another record year

Indications are that construction will shatter all existing records for volume with a total of 60 billion dollars' worth of work this year, H. E. Foreman, managing director of the AGC, told the members at the opening session. New construction is expected to hit 44.5 billion, while repair of existing structures should cost 15.5 billion, he said.

Emphasizing the role the construction industry plays in the nation's economy, the AGC official said that construction, as the industry representing the largest single production activity, "accounted for 15 per cent of all goods and services produced in the nation last year, and was responsible on the site and indirectly for 15 per cent of total employment".

Reporting on the growth of the AGC, Mr. Foreman said that membership now represents 6,561 leading construction firms in the United States and Alaska. These firms, he added, perform more than 80 per cent of the nation's contract construction at home, as well as a large

volume of work abroad.

The effective work of the Joint Board established by employers and unions in the construction industry for the settlement of jurisdictional disputes was discussed by Theophil C. Kammholz, general counsel for the National Labor Relations Board, in an opening-day address. As proof that the industry's own board is handling the major portion of its management-labor disputes, Mr. Kammholz said that in 1955 the board handed down decisions on 237 cases, while the NLRB found it necessary to decide a total of only seven which had gotten by the board.

Mr. Sawyer and Mr. Cisler, also on the opening day's program, spoke as representatives of their respective industries. The former reported on the production of cement in the past and on the optimistic picture for the future. "You can buy cement today," he declared, "with at least an 80-cent dollar in terms of relative prices, as against something like a 40 or 50-cent dollar for other construction materials and machinery".

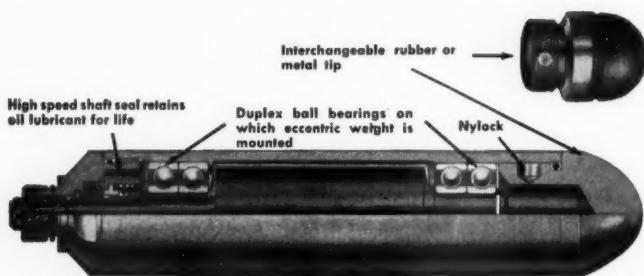
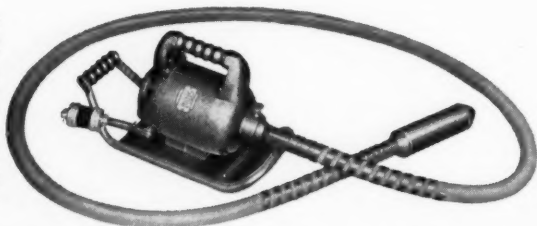
Mr. Cisler assured the contractors that the development of peacetime uses of atomic power will include a major role for the construction industry. Besides constructing atomic power facilities and research laboratories, the industry will, in time, use

New, rugged electric vibrator, newly designed vibrator head, DELIVERS 9000 VPM at 2HP

This new electric concrete vibrator, developed by STOW MANUFACTURING COMPANY, Binghamton, N. Y., features a new light-weight vibrator head that delivers, at high amplitude, 9000 vibrations per minute to the mix.

This vibrator, STOW model BU, is powered by a totally enclosed 2 HP Universal motor, operating on 115 volts, AC or DC, 25 to 60 cycles.

The motor is protected by a skid mounting, so arranged that the unit can be easily pulled around by the flexible shaft.



Take a look at this vibrator head. It is 10 inches long, and available in diameters of 1½, 2 and 2½ inches, capable of 9000 VPM. Vibrations are achieved by use of an eccentric weight mounted in special high speed duplex ball bearings at each end. The outside of the head is case hardened, for extra long wear, and it has a replaceable tool steel tip. STOW estimates that these two improvements alone will double the life of the heads.

Construction men report that they like the light weight, the long life, the low replacement cost, and the terrific wallop of these heads. Weight of the 1½" head is about 5 lbs.; the 2" head, about 7½ lbs.; the 2½" head, about 9 lbs. The cost of this head is less than ½ the cost of expensive motor-built-in type heads.

The 1½" head is also available with a hard rubber tip for use where plywood forms are being used.

For more information about the complete line of STOW concrete electric and gasoline vibrators, vibrating screeds and rotary trowels, contact your STOW distributor, or write for STOW Catalog 552!



STOW

STOW MANUFACTURING CO.

40 Shear St., Binghamton, New York

For more facts, use Reader-Reply Card opposite page 18 and circle No. 417

JOB FACTS ABOUT...

DRILLED ONE
CESSPOOL
PER HOUR
(48" dia. by 25')

DRILLED HOLES
(16" to 84" dia.)
as low as 30¢
PER FOOT OF DEPTH

DRILLED FOUR
(24" dia. by 60")
PIER HOLES
with 72"
BELLED FOOTINGS
IN ONE DAY

DRILLED & BELLED
33 CAISSON
PIER HOLES
(16" dia. by 20")
WITH 30" BELLS
IN 10 HOURS

WORLD'S FASTEST
METHOD FOR BORING
Caisson Pier Holes
Belled Footings
Water Wells
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FASTER DRILLING



THERE IS ALWAYS WORK for a Calweld Earth Drill. Learn how other contractors are using Calwelds; write for a complete set of factual job reports.

CALWELD, INC.

7222 EAST SLAUSON AVENUE • LOS ANGELES, CALIF.



CALWELD BUCKET TYPE EARTH DRILLS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 418

CONTRACTORS AND ENGINEERS

Lester C. Rogers, Chicago, new vice president.



atomic power in its own machinery, he stated.

Agency heads

Representatives—most of them the heads—of governmental agencies which let contracts for construction work were principal speakers during the morning session of the second day and at a special luncheon program. Each reviewed the building program of his bureau and sketched the picture for the future as it affects construction and contractors.

Rear Adm. Robert H. Meade, chief of the Bureau of Yards and Docks, devoted part of his address to an explanation of the Navy's attitude toward negotiated contracts for construction. Explaining that the Navy recognizes the merit of negotiated contracts, he declared the open, competitively-bid, lump-sum contract to be preferable because:

1. It establishes a contract price that is fair to both the government and the contractor.

2. It demonstrates to all that awards are not made on the basis of political or personal influences.

3. It encourages the entrance of new blood into the government construction field.

Adm. Meade also discussed the Navy's requirements in bids on bureau projects, touching particularly on such matters as clear, simply stated plans and specifications, alternate materials or methods, out-of-line bids, and qualified bids.

In addition to forecasting a continuation of the huge air force building program for from three to five years, Gen. Washbourne spelled out the scope of the air arm's building program and explained certain problems that have arisen in its construction.

Pavement criteria, or the old problem of portland-cement concrete versus asphaltic concrete, was touched on briefly by the speaker. He told the contractors that increased aircraft weights, jet blasts, and the problem of fuel spillage have led the air force to the conclusion that "with appropriate exceptions, . . . concrete can 'take it' and blacktop can't" when it comes to airfield runways.

Gen. Sturgis spoke at length on the long record of cooperation between the construction industry—as individual contractors and as the AGC—and the Corps of Engineers. He praised the resources of the nation's contracting and engineering personnel, and said these resources are particularly satisfying in view of the fact that construction for defense "is likely to be a continuing task".

Declaring that "it is obvious that we need more men with long construction experience in top positions of the defense establishment," the Engineers Corps chief called on the AGC to raise volunteers for this work "as an act of patriotism in time of need."

The need for federal highway improvement legislation was diagrammed by C. D. Curtiss, commissioner of the Bureau of Public Roads, at the luncheon program. Other luncheon speakers were W. A. Dexheimer, commissioner of the Bureau of Reclamation, who described the development of water resources in western states, and Fred S. Poorman, deputy commissioner of the Public Building Service, who explained his

agency's operations in constructing and maintaining public buildings.

Mr. Hutcheson's talk to the assembled contractors took the nature of an assurance that labor, now organized in a single fraternity, will not present a united political threat in coming elections.

The more than 15 million individual AFL-CIO members will, as before, exercise their own judgement in politics, the labor leader said, adding that neither party can lay claim to all-out labor support because neither has an all-perfect labor record.

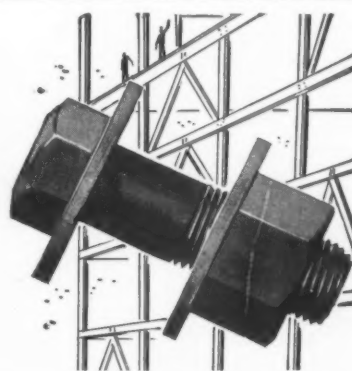
Division meetings

One of the speakers at the separate meeting of the highway contractors'

division was Rex M. Whitton, president of the American Association of State Highway Officials and chief engineer of the Missouri State Highway Department. In discussing the need for enactment of federal highway improvement legislation, Mr. Whitton told the contractors that "the foundation of our economy and prosperity would be jeopardized if inadequate legislation is enacted." He and other speakers throughout the convention program urged the members of AGC to write their congressmen urging passage of the bill this year.

Much of the discussion at the highway contractors' meeting centered about the practice of some material suppliers of including escalator price clauses in their quotations to con-

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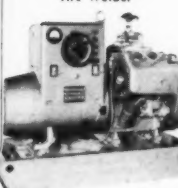


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tractors and their companies.

In discussions here and at other sessions—and which led to the adoption of the resolution deploring this practice—contractors pointed out that such clauses were unfair in view of the fact that the contractors themselves were forced to quote fixed prices when bidding on a job.

A. C. Clark, deputy commissioner for engineering and construction of the Bureau of Public Roads, also spoke at this session. Reports on the successful use of the contract method in letting highway-maintenance jobs, and on work of the AGC with the AASHTO and other organizations were given.

Edward O. Earl, San Xavier Rock & Sand Co., Tucson, Ariz., was elected

division chairman for the ensuing year. W. Ray Rogers, Rogers Construction Co., Portland, Oreg., was named vice chairman.

Senate bill S-1644, which would require general contractors to name all their subcontractors when bidding on projects, came under fire at the meeting of the building contractors' division.

Also criticized at other sessions, this bill was denounced because, in the eyes of the contractors, it "would open the door to segregation of bids." This development would eventually lead to a breakdown of the general contract system, the assembly agreed.

Apprenticeship, general contractor supervision of subcontractors' work, and other topics of special concern to

building contractors were discussed at this separate session. Earl J. Wheeler, Frank Messer & Sons, Inc., Cincinnati, Ohio, and Charles B. Solomon, George B. H. Macomber Co., Boston, Mass., were chosen chairman and vice chairman, respectively, of this division.

Members of AGC concerned especially with heavy construction and railroad work heard reports on specifications involved in work supervised by the four governmental construction agencies at their divisional meeting. Representatives of these four agencies commented after the reports were given.

Here again, as in the earlier business session for the entire membership, the work of each agency was

discussed, the prospects for future construction outlined, and the peculiar contractual and specifications procedures of each group spelled out.

A highlight of this session was the showing of three-dimensional colored slides and colored motion pictures taken during substructure and superstructure work on the Richmond-San Rafael Bridge in California. J. Philip Murphy of the Judson Pacific-Murphy Corp., Emeryville, Calif., showed slides and commented on the fabrication and erection of the superstructure, while Ben C. Gerwick, of Ben C. Gerwick, Inc., San Francisco, Calif., showed motion pictures and explained construction of the substructure.

William H. DeButts, C. F. Lytle Co., Sioux City, Iowa, was named chairman of the division, and F. S. Oldt, F. S. Oldt Co., Dallas, Texas, vice chairman.


Conclusions of the discussions at the separate meetings were reported to the convention committee on resolutions and, in many cases, reflected in the resolutions adopted at the final business session.

Accident prevention

Reports of various AGC committees which work the year around were submitted at the convention. One of these, the accident-prevention committee, staged a ceremony during which 63 safety awards were made to contractor firms, manufacturers, highway officials, and AGC districts and chapter distinguished for their safety records. Some many-time award winners were called on to describe briefly the methods they use to achieve safety records.

The membership committee reported that an intensified drive for 1,000 new members will be made during the year. Financial and budget reports indicated that the AGC—

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CONTRACTORS AND ENGINEERS

largest trade association in the country—is operating “in the black” and with a substantial reserve fund. Lester C. Rogers, Bates & Rogers Construction Co., Chicago, Ill., was installed as vice president of the association.

Nineteen new national directors, elected for three-year terms and installed at the closing session, include the following:

G. B. Seebeck, The Green Co., Spokane, Wash.; J. A. Woodworth, Woodworth & Co., Inc., Tacoma, Wash.; Frank F. Burrows, Williams & Burrows, Inc., Belmont, Calif.; William E. Irish, E. A. Irish, Los Angeles, Calif.; Keppel Brierly, J. & K Construction Co., Denver, Colo.; J. Rutledge Hill, Gifford-Hill & Co., Dallas, Texas; I. G. Homes, Homes & Son Construction Co., Phoenix, Ariz.;

W. Murray Werner, The Werner Co., Shreveport, La.; Robert A. Dobson, Dobson Bros. Construction Co., Lincoln, Nebr.; V. B. Higgins, V. B. Higgins Co., Greensboro, N. C.; J. D. Meland, Jay W. Craig Co., Minneapolis, Minn.; Robert E. O'Connor, Robert E. O'Connor & Sons, Inc., Fort Wayne, Ind.; E. J. Wheeler, Frank Messer & Sons, Inc., Cincinnati, Ohio; W. M. Wheeler, J. A. Jones Construction Co., Atlanta, Ga.; V. R. Gorham, Cleary Bros. Construction Co., West Palm Beach, Fla.; John W. English, Frank G. English & Sons, Inc., Philadelphia, Pa.; Charles A. Selby, Paul Tishman General Contractor, Inc., New York, N. Y.; W. J. Salter, Stewart & Williams, Inc., Augusta, Me.; and Charles B. Solomon, George B. H. Macomber Co., Boston, Mass.

Besides the extensive business schedule, the four-day convention included social affairs highlighted by a formal banquet and dance honoring the outgoing and incoming presidents.

THE END

Euclid appoints new regional managers

Four regional managers have been appointed by the Euclid Division of General Motors Corp., Cleveland, Ohio. Heading the eastern region is John A. Polhemus, who will maintain offices in New York, N. Y. His territory will include eastern Canada, Maine, Rhode Island, Vermont, New Hampshire, New York, Massachusetts, Connecticut, New Jersey, Maryland, Delaware, the District of Columbia, and eastern Pennsylvania.

In the central region, covering North and South Dakota, Wyoming, Colorado, New Mexico, Arizona, Oklahoma, Kansas, Nebraska, Iowa, Missouri, Illinois, Wisconsin, and Manitoba, Canada, E. C. Dellen is the new manager. His headquarters will be in Kansas City, Mo. C. B. Pace will handle the southern region, which includes Texas, Arkansas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, Kentucky, West Virginia, and Virginia. His headquarters will be in Atlanta, Ga.

M. H. Johnson is western regional

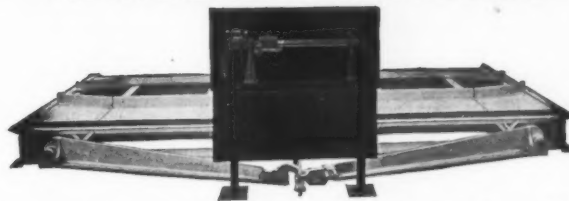
manager. From headquarters in Oakland, Calif., he will cover the states of Utah, Nevada, California, Montana, Idaho, Oregon, Washington, and Alaska and western Canada.

Now manager of the home-office district, with headquarters in Cleveland, J. E. Ehlerl will cover Ohio, Michigan, Indiana, and western Pennsylvania.

As manager of the Hibbing, Minn., branch, R. M. Brown will cover Minnesota, and the upper peninsula of Michigan.

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Weather charts

The weather outlook for April

The two accompanying maps showing the number of days with rainfall and the number of days with temperatures 32 degrees or lower indicate weather conditions that might be expected throughout the United States during the month of April. Those areas indicated on Chart I as dry will have an average of fewer than 8 days of rainfall during the month. Between 8 and 12 days of rain can be expected in the medium areas, and more than 12 rainy days are forecast for wet regions.

According to Chart II, warm areas will have an average of fewer than 8 days of below-freezing temperatures. Medium areas will experience between 8 and 12 below-freezing days, and cold regions can expect more than 12 low-temperature days during the month of April.

The charts may be used in a rela-

tive sense also. For example, judging by the number of rainy days, contractors in northeastern Montana and San Francisco, Calif., will have about the same amount of working time. Those in Missouri can accomplish relatively more work than those in Ohio because there will be more dry days. More freezing days can be expected in New York and northern Pennsylvania than in Illinois and Indiana.

These charts, prepared for CONTRACTORS AND ENGINEERS by Weather Corp. of America, 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo., show only average conditions and are not intended as specific forecasts. However, upon request, Weather Corp. of America will supply additional information about the charts or about the applied use of climatology.

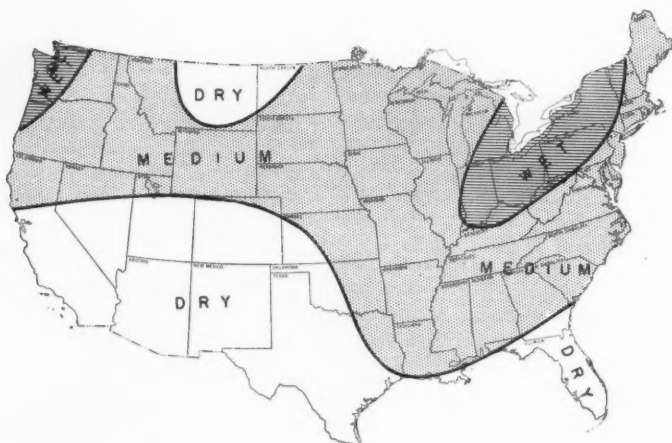


Chart I: Precipitation

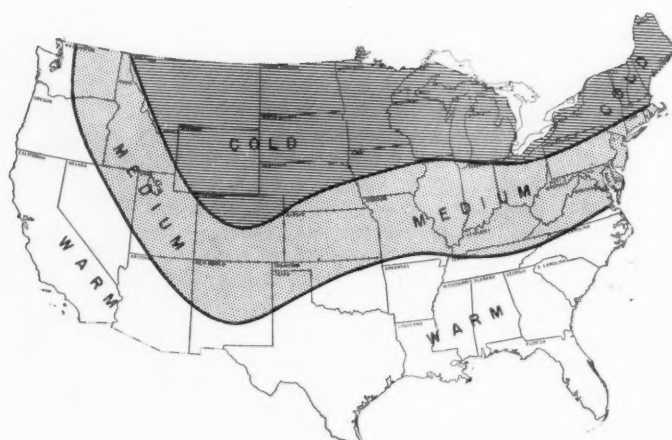


Chart II: Temperatures 32 degrees or lower

New firm is organized for soil-stabilization study

Harry J. Seaman, a pioneer in the study of soil stabilization on highway and airport construction, has organized a new firm for the study of soil stabilization and related mechanization. To be known as the Seaman Engineering & Research Corp., the firm will make its headquarters in

Milwaukee, Wis., and will be under Mr. Seaman's direct supervision.

The new company will also design and develop new types of roadbuilding equipment.

Seaman is the inventor of the Pulvi-Mixer and of gas engines and a rotary-type soil tiller.

Alco Products appoints public relations manager

In a reorganization of its public relations functions, Alco Products, Inc., Schenectady, N. Y., has appointed Dana T. Hughes director of the department. He will have over-all

responsibility for the operation of the company news bureau and will handle special treatments of new product facilities, and processes. Roger C. Witherell will handle the news bureau.

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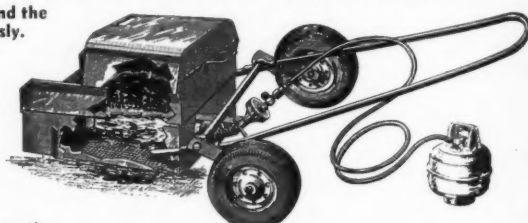
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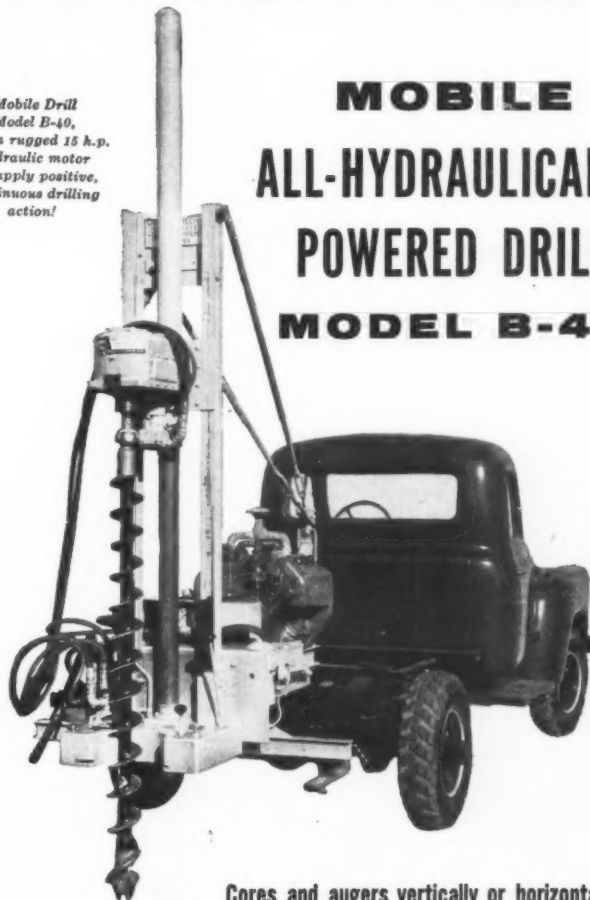
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HOW MOTO-PAVER PAVED THE WAY TO

An economical paving program for small cities and towns

A simple yet economical and unique construction program is providing the city of Andrews, Texas, with a network of paved streets probably unequaled in any other town of its size (population 8,000). The project calls for 300 city blocks to be paved, complete with curbs and gutters, in widths from 33 to 60 ft., and averaging 40 ft.

The techniques and methods of operation utilized by the contractors, Centex Paving Co., of San Antonio, have resulted in a most economical program, according to Jim Dailey, Centex president. Says Mr. Dailey: "The two greatest factors in the economy of the program are: 1. Utilization of a Hetherington

& Berner Moto-Paver, and 2. Production of asphaltic concrete aggregate from material at the local pit."

Heavy rains in the Andrews section of Texas gave officials and contractors an excellent opportunity to test the quality of the work. One street laid about the first of July was under water from one to three feet deep five different times. An estimated 10 inches of rain fell—most of it in flash floods. Inspectors found no soft spots, no cracks—no evidence of any kind of damage.

For complete information on how Moto-Paver can help you to "speed the job—cut the cost," see your local H&B distributor, or write direct for Bulletin MP-55.

HETHERINGTON & BERNER INC.

ENGINEERS...MANUFACTURERS

731 KENTUCKY AVENUE INDIANAPOLIS 7, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 432



80 TONS ON A SINGLE SHEAVE?

Certainly, — with McKISSICK Unusual Requirements become Usual.

Dependable, long lived performance for working load assured.

Double row opposed Timken Bearings mounted on 8" diameter center pin, permanently sealed with lip type closures. Alloy steel flame hardened sheave, heat treated 4140 Hook.

McKISSICK

McKISSICK PRODUCTS CORPORATION
 Box 2496 Tulsa, Oklahoma

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GRACE

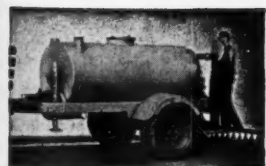


3 sweeper models, axle, engine or tractor powered.



Sheepfoot Rollers
250 to 600 psi.

GRACE Asphalt and Compaction Equipment



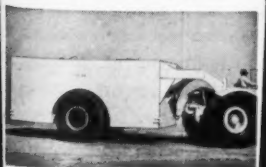
Rapidspray Maintenance Distributors.
Also heaters for production melting
of barreled asphalt.



Rapid Fire circulating heaters heat and
unload large tanks of asphalt.



Chip spreaders 8' to 12' width. Also
asphaltic concrete spreaders.

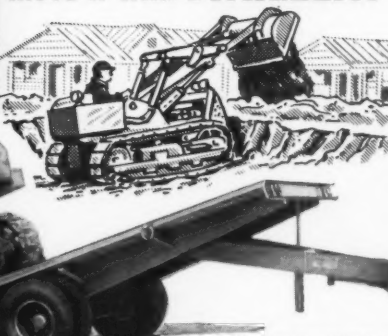


Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.

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To cover
more jobs
with one tractor...



MILLER "B" 10 ton \$1175*
F.O.B. Milwaukee
Any optional equipment extra
*Plus Freight and 8% Federal Tax

Quick maneuverability, fast loading cuts time between jobs!

Shuttling tractors from one job to another with a MILLER Tilt-Top is so easy, so fast . . . it can put more dollars in your pocket every day! One man can tilt, simply drive the equipment onto the broad, oak decked platform, be on his way in less than two minutes! This fast loading and unloading, precise, easy backing, on-a-dime maneuverability, cuts time between every job . . . steps up productive time for men and machines! That's why MILLER Tilt-Tops' equipment shuttling cover more jobs with one tractor . . . can often save duplicating expensive equipment.

For hauling dozers, rollers, trenchers, shovels and other heavy equipment there are a variety of single or tandem axle Tilt-Tops or low beds. All are equipped with Timken roller bearings, massive "EDG-SUPPORT" frames and 2" oak deck platforms!

And you pay no premium for quality . . . no comparable trailer undersells a MILLER! See these production boosters at your MILLER distributor today — and compare!



Miller Model "D" 4 ton Low Bed
\$595.00* F.O.B. Milwaukee
Any optional equipment extra
*Plus Freight and 8% Federal Tax

See your MILLER distributor
or write for FREE literature to:

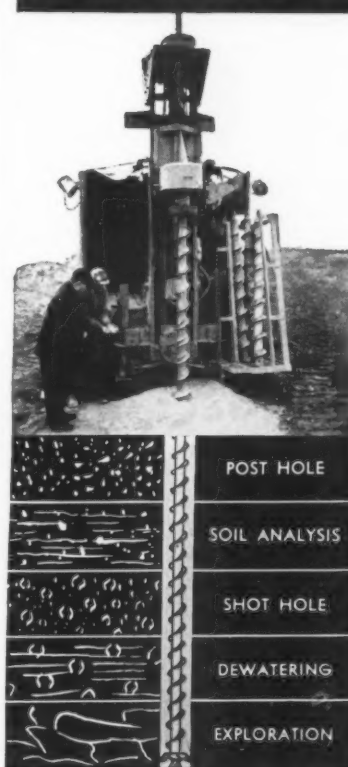
Miller
Tilt-Top Trailer Co.

456 S. 92nd St., Milwaukee, Wis.

✓ built best
✓ priced best

For more facts, use Reader-Reply Card opposite page 18 and circle No. 435

DEEPER, FASTER McCARTHY NEW HEAVY-DUTY VERTICAL AUGER DRILLS



AUGER DIAMETER	DEPTH OF BORE
20" and 24"	16' to 30'
12" and 16"	60' to 70'
3", 4 1/2", 6", 8" and 9"	up to 125'

for drilling in earth, clay, compacted sand and gravel, and soft shale formations.
for drilling the above, plus drilling in hard sandstone formations.

Choose the most desired size auger for each drilling depth, in any vertical drilling operation. The new McCarthy Model 106-24 Vertical Auger Drill handles augers from 3" to 24" in diameter.

Adjust drilling speed properly for various rock and earth formations. Model 106-24 has two output shafts, one speed for earth and one for rock. A gear reducer slows auger rotation for harder rock formations. This gives more torque, or "biting power" in sand rock and soft limestone.



Write for Bulletin M-100

THE SALEM TOOL CO.
806 SOUTH ELLSWORTH AVE.
SALEM, OHIO, U. S. A.

For more facts, circle No. 436

Critics of big spending on the part of the federal government know that the power to spend is practically synonymous with political power. Though these severe critics deplore the ever-growing role played by Washington in state, county, and local affairs, they have to admit that many states and cities are to blame for the situation. Some seem incapable of collecting enough money to meet current

construction needs, aside from those that may be demanded in the future. Some have the money, but political arguments prevent its being spent. And far too many still refuse to plan—not for today—but for 20 years from today. As a result, local problems of traffic congestion, urban blight, crowded schools, and inadequate airports multiply rapidly even as new ways of raising revenue be-

come harder to find.

Behind some of the big debates in Washington this year will be the question of whether the Federal government should assume an even larger role in state and local construction. Washington already pays for half the cost of building intercontinental express airports; it pays half the cost of primary, secondary, and urban roads; it makes grants and

loans for urban redevelopment. A major issue before congress this year is whether the federal government should now enter the field of school construction.

Two school bills are up for consideration, and both differ little in their objectives. One, introduced in the House by Pennsylvania Democrat Augustine B. Kelley, provides for \$400 million in grants to states each school year for four years. The money would be divided according to the school-age population in each of the states.

The administration bill, which was introduced by Senator H. Alexander Smith, (R-N. J.) calls for only \$250 million each year for five years. But this measure divides the money among states by a complex formula that considers not only the number of school children, but also state income and the relative effort made on the part of states for school purposes. Both bills would permit the federal government to buy up to \$750 million in local school bonds during the effective life of the law.

Powerful opposition to both bills has come from several groups, including the Council of State Chambers of Commerce. The Council claims that "political inspiration rather than real need" is the basis for federal aid to school construction programs.

To back up this contention, the Council quotes from the report of the Education Study Committee of the Commission on Intergovernmental Relations, which stated that schools "can be provided by local communities more satisfactorily and equitably than by the federal government". The cost of additional schools, the report continued, can be met by state and local governments if they continue to boost their school contributions. "An effective way in which the federal government can aid these efforts," the report added, "is to reduce its tax bill." The Council also pointed out that the White House Conference on Education agreed that "no state represented here has a demonstrated financial incapacity to build the schools it will need during the next five years." But the White House group warned that most of those states were not determined enough to get new schools, and so did not overcome the obstacles in their way.

Airport construction is going to require more and more money in the near future as the country heads toward the jet age. This was emphasized strongly at a Civil Aeronautics Administration meeting on jet airliners, when the mayor of Atlanta, Ga., warned that airport construction bonds are going to compete with school and street bonds. Mayor Hartford, the president of the American Municipal Association, declared that there is a limit to how much more money cities are going to allocate for

—For more facts, circle No. 437

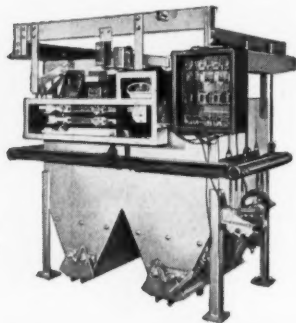
CONTRACTORS AND ENGINEERS

AUTOMATION

...Another Butler FIRST!

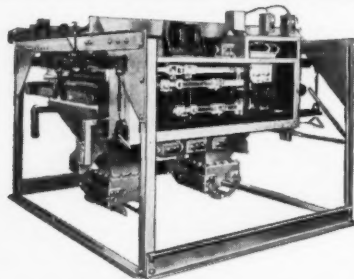


PUSH-BUTTON-CONTROLLED BATCHERS



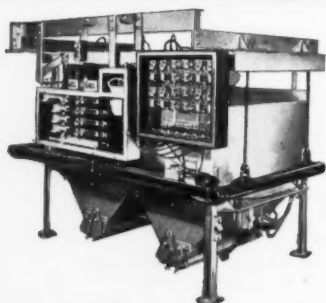
SAND BATCHER

Discharges two batches simultaneously, electrically controlled at cement batcher, by truck driver, or by operator on sand batching plant.



CEMENT BATCHER

Here one man operates all 3 units or cement batcher alone. Hoppers accurately charged by combination of rotary gate (for speed) and vane feeder (for final accuracy).



STONE BATCHER

Discharges two batches of 2 stone sizes each. Correct proportion of each size stone provided by cross feeds from each battery of hoppers.



Completely Automatic Road Builders' Plant... ONE-MAN-OPERATED

One man . . . one finger . . . one push button controls batching of sand, cement, and 2 sizes of stone — the great new Butler 0-1-0 Automatic Road Builders' Plant. Electric controls at the cement batcher operate any one, two or all three plants — maintaining performance efficiency that easily keeps up with two 34E dual drum pavers.

MASTER CONTROLS are pre-set for any selected batch proportion you need — and can be easily changed for new specifications. If the contractor prefers, the truck driver himself can actuate either the sand or stone batchers without leaving the truck cab.

World's Most Portable Plant

Another exclusive Butler engineering feature is the hinge and pin attachments for supporting columns, which permit amazing savings in erection time — and in relocation. Special electrical connectors between batchers require only quick plug-in — and you're ready to operate in your new location.

BUTLER BIN CO.
WAUKESHA, WISCONSIN

the making of improvements on their municipal airports.

"For the last 15 years," he said, "cities all over the nation have been madly issuing bonds for enlarging airports and extending runways so that these facilities will be able to handle bigger planes." The mayor's comments followed the revelation that every airport in the U. S., except that in Boston, will be too small for the intercontinental jetlines presently under order by commercial airlines. A 4,000-mile range jetliner will need from 9,000 to 9,500 feet of runway to take off and, making corrections for altitude and temperature, no airport outside of Boston has as much as 9,000 feet, not even New York's Idlewild.

At a big Air Force Association Jet Age Conference in Washington shortly afterward, Gen. Jimmy Doolittle observed that if Idlewild is not big enough, "where on earth are we going to build airports that are?"

But it was not only the location of airports that bothered municipal officials. It is estimated that a heavy-duty runway, with its associated taxiways and utilities, costs about \$1,000 per foot, or one million dollars for 1,000 additional feet. This excludes the cost of the land.

Other problems came up at the two jet conferences. The jetliners will be heavier when loaded than any commercial planes now in use. While many of the large U. S. airports already have adequate bearing strength, some will have to be made stronger. One specialist recommends that an overlay, less costly than complete new runways, be used in these instances.

Airport operators at the meetings wanted to know if jetliners would make asphalt runways obsolete. Warren Dickinson of Douglas Aircraft, one of the leaders in jetliner development, replied that a moving jet blast does not raise any problem. But in the run-up area, when the plane is standing still, some form of concrete would be necessary. Dickinson declared, "unless the asphalt people can come up with a high-temperature material."

Airports already plan to spend more than half a billion dollars on expansion within the next four years. Increased traffic, not new aircraft, is behind this unprecedented spending. Outmoded terminals, some built to handle four or five flights a day, are being replaced with modern, multi-million dollar structures that can accommodate several thousand visitors every 24 hours. When it comes to spending, the CAA may match state or local airport funds on a 50-50 basis for about 760 airports eligible for such aid.

The new highway program is still being tugged this way and that in congress. After conferences with GOP congressional leaders, President Eisenhower okayed the pay-as-you-go principle for highways, and Rep. Hale Boggs, (D-La.) introduced the Democratic financing bill. But before the

House Ways and Means Committee could open hearings on the measure, the Administration turned cool again.

In a private meeting with GOP members of Ways and Means, Secretary of the Treasury Humphrey is said to have criticized the Boggs bill as anything but a true-pay-as-you-go plan. And Commerce Secretary Weeks told a House Public Works subcommittee that 13 years is too long a period for the completion of the interstate system. "It is very necessary," he said, "that the interstate system be completed over a period of ten years, as recommended by the President."

In spite of all wrangles, Ways and

Means had set late February as a target date for reporting out some sort of financing plan, so that members could get on to other important business. It was clear that whatever form any expanded federal-aid highway bill would take, it would include a one-cent increase in the gasoline tax, upping the levy to three cents per gallon. Diesel oil and other special fuels may also go up a cent.

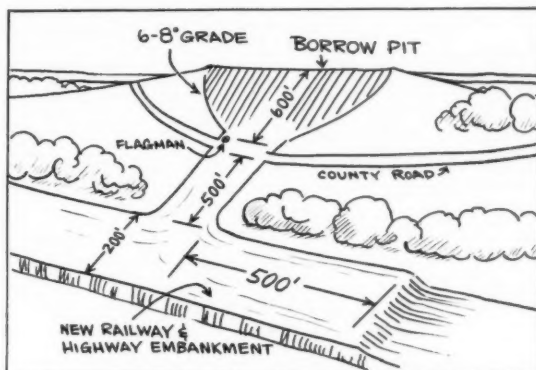
Other Boggs financing proposals seemed likely to run into heavy fire. His bill would raise tire taxes from five to eight cents per pound, jump the truck and bus tax from eight to ten per cent, and impose a new three-

cent per pound excise on camelback.

The Louisiana congressman claimed that the taxes he suggested would bring in an additional \$12 billion in revenue over the next 15 years, with the gasoline increase alone accounting for an estimated \$8.6 billion of this amount.

(Current disagreement about highway financing is reminiscent of 1955 congressional proceedings, when no action was taken on a road bill. Urgent messages to your congressmen now will help spur highway legislation which some feel is "again dropping into low gear".—Ed.)

ANOTHER TEST— ANOTHER WIN FOR NEW CAT* LOWBOWL SCRAPERS!



DESCRIPTION OF TEST

JOB AND LOCATION: Highway and railroad relocation near North Liberty, Iowa, involving 600,000 cu. yd. of fill. Contractor: The Stewart and Rank Construction Co., Bettendorf, Iowa.

CONDITIONS: Material — wet-damp gumbo and red glacial clay mixed with gravel. Loading conditions — borrow area with 6 to 8% favorable grade, Cat D8 Tractor used for pusher. Haul distance — 1600 feet. Return distance — 1600 feet. Grade — 600 feet of 6 to 8% favorable grade out of borrow area, remainder negligible. Return same route.

AVERAGE CYCLE TIME:	DW21-No. 470 LOWBOWL Scraper	DW21-No. 21s
LOAD	1.00 min.	1.02 min.
HAUL	1.40	1.65
DUMP	.69	.60
RETURN	2.51	2.88
Total no-delay cycle time	5.60	6.15
Wait and delay time (average of all units to facilitate comparison)	.70	.70
TOTAL CYCLE TIME	6.30	6.85

COMMENTS: Though the DW21-No. 470 LOWBOWL Scraper carried larger loads, the combination of its turbo-diesel horsepower, highly efficient power train and big, wide-section tires gave the unit a 14% advantage in cycle time.

In the dump area, its power, traction and flotation really paid off. Noncurrent models often had to be pushed while unloading — the new machine seldom required pushing.

FIRST in loading tests on the Kansas Turnpike against six competing scrapers, including one noncurrent DW21-No. 21, which was runner-up!

FIRST AGAIN, against two DW21-No. 21s, in tests in Iowa!

Test after test in the field proves the ability of the new Cat DW21 (Series C)-No. 470 LOWBOWL Scraper to deliver bigger, faster loads than competing scrapers — including the unit it succeeded, the DW21-No. 21. Here's a recent test made in Iowa. Look it over — see how Caterpillar's exclusive LOWBOWL design pays off in bigger production on the job!

Complete details of this and other on-the-job tests are carried by your Caterpillar Dealer's salesman. Ask him to show them to you.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

RESULTS OF IOWA TEST

	DW21-No. 470 LOWBOWL Scraper	Noncurrent DW21-No. 21s without sideboards
Average load in bank cu. yd.	18.9	15.5
Total average cycle time on 3200-ft. round trip	6.30 min.	6.85 min.
Trips per hour	9.5	8.8
Production in cu. yd. per hour	180	133

LOWBOWL ADVANTAGE in bank cu. yd. per hour: 47



NEW CAT DW21 TRACTOR-NO. 470 LOWBOWL SCRAPER New Turbo-charged 6-cylinder Cat Engine packs 300 HP at 1800 RPM. Scraper capacity is 25 cu. yd. heaped, 18 cu. yd. struck. Exclusive LOWBOWL design loads more material faster because of less loading resistance. And now advanced-design, wide-section tires are standard equipment. These tires give better flotation and traction in soft going.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**BIGGER, FASTER
LOADS WITH CAT
LOWBOWL SCRAPERS**



Michigan Model 175A owned by E. J. Petrillo, Inc., sold and serviced by United Tractor and Equipment Corp., N. Y. C.

On the New York Thruway

This 2¼-yd. Michigan loads out 6-ton oversize blast rock

This photograph shows a section of E. J. Petrillo's contract on the New York Thruway where the contract called for removal of an old granite quarry. Petrillo used one of his 2¼-yd. Michigan Tractor Shovels to load out oversize blast rock. Some of the rock weighed as much as 6½ tons and measured close to 8 ft. wide.

Substitute for 4-yd. crawler

Superintendent Tony Tangredi said

Note the size of the stones being loaded into the rear-dump.



that the job normally would have called for a 4-yd. crawler-loader, but the crawler-loader wasn't available. So he decided to try the Michigan, even though he considered this an unusually tough assignment for a rubber-tired machine. During the three weeks the Michigan was on this job, its performance was satisfactory in every way.

Speed on the job

Petrillo's Michigans are always on the move—loading trucks in the borrow pit, handling general clean-up work all over the job. "A big advantage to us is the maneuverability of these Michigans", says Supt. Tangredi. "At 27 mph, they get where they're needed in a hurry—and you don't need trailers to move them. On this rock-handling job, we proved that the Michigans will handle the tough assignments along with the routine jobs."

Handles the tough jobs

Like E. J. Petrillo, Inc., more and

more owners have found that a Michigan will handle jobs which have always been considered too tough for rubber-tired Tractor Shovels. The exclusive Clark power-train—torque converter, power-shift transmission and planetary wheel drive axles—gives the Michigan more useable power and traction than you've ever seen on this type of machine. Your Michigan distributor would like the chance to prove it. Ask him to demonstrate on one of *your* tough jobs—you name it.

Michigan is a reg. trade mark of

CLARK EQUIPMENT COMPANY

Construction Machinery Division

2407 Pipestone Road

Benton Harbor 15, Michigan



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